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ABSTRACT

This document contains seven papers about and from an international meeting on promoting linkage between technical and vocational education and the world of work. The first paper, a Final Report on the "International Expert Meeting on the Promotion of Linkage between Technical/Vocational Education and the World of Work (Tokyo, Japan, 3-6 February 1997)," examines the following: the meeting's purpose; main points raised in the keynote and country papers and multimedia presentations; major issues (major implications of multimedia and networks and their use to develop competencies through self-learning; financing of the development of multimedia approaches; evaluation of student achievements through multimedia methods; and new roles of teachers); field visits connected with the meeting; and recommendations to United Nations Educational, Scientific and Cultural Organization (UNESCO) member states. The following six papers constitute the remainder of the document: "International Trends and Developments in Technical and Vocational Education" (Gregor Ramsey); "Technical Education and the World of Work: The Brazilian Context" (Ana Maria Lakomy); "Current Trends of TVET [Technical and Vocational Education and Training] in Germany" (Antonius Lipsmeier); "Linkage between Technical and Vocational Education and the World of Work in Indonesia" (Rina Arlianti); "Technical and Vocational Education in Japan" (Haruo Nishinosono); and "The Promotion of Linkage between Technical/Vocational Education and the World of Work in Korea" (Tae-Hwa Jung). (MN)

UNEVOC Studies in Technical and Vocational Education ◆ 10

ED 424 420

Promotion of Linkage between Technical and Vocational Education and the World of Work

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(English, 1995);

4. *New Perspectives on Assessment*
(English and Chinese, 1995);

5. *Functional Literacy, Workplace Literacy and Technical and Vocational Education: Interfaces and Policy Perspectives*
(English, 1995);

6. *Vocational Guidance for Equal Access and Opportunity for Girls and Women in Technical and Vocational Education*
(English, 1996);

7. *Promotion of the Equal Access of Girls and Women to Technical and Vocational Education*
(English, 1995);

8. *Current Trends and Issues in Technical and Vocational Education*
(English, 1996);

9. *Technical and Vocational Education for Rural Development: Delivery Patterns*
(English, 1997);

10. *Promotion of linkage between Technical and Vocational Education and the world of work*
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FOREWORD

This publication is one of the series entitled "Studies in Technical and Vocational Education" distributed by the Section for Technical and Vocational Education, UNESCO within the framework of the UNEVOC Project. UNEVOC is the acronym of UNESCO's International Project on Technical and Vocational Education, which was launched in 1992. This project focuses primarily on the exchange of information, networking and other methods of international co-operation between specialists in technical and vocational education.

This monograph includes the Final Report of the UNEVOC International Expert Meeting on the Promotion of Linkage between Technical and Vocational Education and the World of Work which was held in Tokyo, Japan, from 3-6 February 1997 and the selected country papers submitted by the participants of the meeting. Due to the limited space available, and as agreed by the authors, the papers were simplified by the editor.

UNESCO wishes to express its appreciation to the Japanese Ministry of Education, Science, Sports and Culture (MONBUSHO) and the Japanese National Association of Technical High School Principals for hosting and sponsoring the above-mentioned event. UNESCO also wishes to thank all those who contributed their work to this publication.

The views expressed in the papers of this monograph are those of the individuals concerned and do not necessarily reflect those of UNESCO. The designations employed and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the UNESCO Secretariat concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

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International Expert Meeting on the Promotion of Linkage Between Technical/Vocational Education and the World of Work (Tokyo, Japan, 3-6 February 1997)

Final Report

INTRODUCTION

Technical and vocational education, by its nature, has to be connected with other sectors of society in order to educate and train the technical personnel and skilled workers needed for socio-economic development. In today's rapidly changing society, it is essential for technical and vocational education to strengthen its linkage with the world of work in order to meet changing requirements. Meanwhile, easy access is warranted to technical and vocational education in corresponding to emerging demands for this type of education as a lifelong learning process.

UNESCO's International Project on Technical and Vocational Education (UNEVOC) which was launched in 1992, is dedicated to developing and improving technical and vocational education in UNESCO's Member States, through information exchange, networking and other methods of international co-operation. Strengthening linkages between technical and vocational education and the world of work is one of the major topics which have been dealt with by this project.

A UNEVOC Inter-regional Seminar on Co-operation between Educational Institutions and Enterprises in Technical and Vocational Education was held in Berlin, Germany in May 1995. The participants at this event discussed issues and strategies concerning the development of effective co-operation between technical vocational education settings and enterprises. Based on the outcome of this seminar, UNESCO organized an International Expert Meeting on the Promotion of Linkage between Technical/Vocational Education and the World of Work in collaboration with the Ministry of Education, Science, Sports and Culture (MONBUSHO) of Japan, in Tokyo, Japan, from 3-6 February 1997.

The main objectives of this meeting were to facilitate exchange of experiences in the various modalities of linkage between technical/vocational education and the world of work (including industry,

local community, and so on.) among participants, as well as to introduce and study Japanese innovative practices in this field. It was attended by experts from eight (8) Member States including Australia, Brazil, China, Germany, Indonesia, Japan, the Republic of Korea and Saudi Arabia. An observer from Canada also attended. Experts from Thailand and the United States were invited and their discussion papers were submitted to the meeting. Due to other engagements, they were not able to participate in the event.

OPENING OF CONFERENCE

The Conference was opened by Mr. D. Ikeda, Director of the Vocational Education Division of the Japanese Ministry of Education, Science, Sports and Culture (MONBUSHO).

He stressed the importance of the links between TVE and work, and hoped that ideas about linkages would develop over the days of the meeting which could be followed up to put into effect the deliberations.

Mr. S. Horie, Executive Secretary of the Japanese National Commission for UNESCO also welcomed the participants. He pointed out that Japan had been an active Member State of UNESCO since 1951 and a strong supporter of UNEVOC since its inception in 1992. He stressed the importance of finding ways and means for the providers of TVE to collaborate with industries.

Mr. S. Iguchi, President of the National Association of Technical High School Principals also addressed the session. He expressed the interest of his association which was established in 1956 in the deliberations of the meeting and welcomed the participants to visit one of the technical high schools in Tokyo later in the week.

After a short self-introduction of the participants, the bureau of the meeting was elected. Mr. Nishinosono (Japan) was elected as Chairperson, Dr Lakomy (Brazil), as Vice-Chairperson, and Dr Ramsey (Australia) as Rapporteur. The provisional agenda of the meeting was then adopted.

PRESENTATION OF KEYNOTE PAPER

Three keynote papers were prepared for the meeting by Dr. G. Ramsey (Australia), Mr H. Nishinosono (Japan) and Dr G. Houlihan (U.S.A). The first two were presented at the beginning of the meeting.

Dr Ramsey's keynote paper titled "International Trends and Developments in Technical and Vocational Education" outlined recent trends and important issues concerning the linkage between TVE and the world of work, based on the experience in Australia and in other parts of the world.

Many countries are interested in the issue of key competencies which are acquired by learners in TVE and they have been discussed with attempts made to enhance these competencies in the future. The major problem with their implementation was seen to be the lack of training of most teachers to inculcate them and the lack of appropriate curriculum to serve the needs of the students.

It was further pointed that Australia was considered to have a strong State system of education and it was interesting to see these State responsibilities given over to the national government in the development of the new apprenticeship and traineeship system. The concept of a national approach to TVE was seen to be most important.

The second keynote speech was made by Mr Nishinosono of Japan. He introduced the policies and innovative practices in Japan to promote linkages of TVE with the industries.

It was pointed out that a number of Asian countries, children were suffering from their parents' ambitious of wishing them to go to university rather than TVE. It was noted that this was not only a tendency typical for the Asian societies, but common in the countries of the Western world as well. It was pointed out that the relatively low status accorded to TVE in so many countries was demonstrated also in Japan, and there had been a significant move away from TVE to general education and university preparation.

The integrated course now in operation in some Japanese schools was seen as a significant achievement with increasing popularity and being successful. It is still in an experimental stage, but it is important to prepare young people for a wide range of work opportunities that society can provide.

The involvement of industry in the Japanese situation was not easy to define. The National Council on Vocational Education requires each course to observe appropriate standards and that the course reflects appropriate attitudes, which require a specific methods of teaching. Some companies are expected to provide computers in their work places for educational purposes. Some companies accept students from integrated courses, who have acquired the skills they need, through in-school training. Also, considerable use is made of people from industry visiting schools to demonstrate the nature of their work.

It was noted that more than 90 per cent of Japanese children reach the end of high school (12 years). Hence, the industries have the chance to enroll these young people into their own training programmes since they possess the necessary general skills required for their jobs. Due to this reason, there is only limited co-operation between employers and TVE schools.

Unlike many countries, companies in Japan feel responsible for providing their own training, and they prefer to employ people with general skills. However, it presents a problem for some small business or manufacturer that they cannot provide sufficient training for new employees in their companies.

In the integrated course in Japan there is no differentiation between courses for boys and girls. Many courses that have become obsolete have been transformed into new areas, providing more general training.

PRESENTATION OF COUNTRY PAPERS

There were presentations from seven countries which stimulated discussions, and some considerable diversities emerged. The German dual system has clearly had significant influence on the TVE system worldwide and had been adopted with modifications in several countries, while it was under increasing scrutiny in Germany itself.

Some issues, relating to the status of TVE dominated over the issues, related to the nature of courses, structural changes, or orientation modular or competency-based training programmes. Other issues which emerged at the meeting, were related to the salary potential of graduates, the lack of training and lack of experience of the teachers, and the reinforcement of the social stratification.

It was determined that there were increasing pathways for the students from school to work and that special arrangements were made for TVE students to continue their studies to universities. One example given was by the Republic of Korea, where their new universities are intended only for students who have come from TVE stream. It was considered that students undertaking work in the 3D category - dangerous, difficult and dirty - should be given close consideration in a nation's education system. It was noted, too, that such jobs were becoming increasingly mechanical

and "high tech".

It was also noted that in some countries, the schools act as enterprises, producing and selling goods and services. This was seen to have a positive side by providing direct work experience, but at the same time it could distort the curriculum if the goal to earn money was too intensive and may become source of friction with private sector competitors, unless special care was taken.

It was further noted that the dual system is oriented towards providing general and cultural education in parallel with the development of skills. This was why the vocational school in Germany, for example, remains the corner stone of the system. Even where major companies undertake all the training, for example Siemens in Germany, this cultural education was still an important part of the curriculum.

The importance of foreign experts going to developing countries and to advise on TVE directions was also mentioned. In general, each country needs to adapt some ideas from other countries for their own purposes. Saudi Arabia's use of experts from Japan, Germany and the United States of America, and Indonesia's use of German and Australian experts to develop their own version of the dual system (Peridikan Sistem Ganda) were quoted as examples in this respect.

MULTI MEDIA PRESENTATIONS

Two multi media presentations took place during the meeting. The first was presented by Katsura Kawakami who introduced a new experiment of vocational education for the staff of PANASONIC. The presentation emphasized the efficient, effective, cheap and wide coverage of their network system. For example, it took a student only 38 hours to complete a course on the network which would take 80 hours on conventional training in the classroom.

The second presentation was given by Yosuhiro Morimoto of the NEC Corporation. He referred to networks that have been established within Japan (an experiment involving 111 schools) and also implemented international scale where they hope to have more than 100 schools connected by March 1997. The Company has also two-way TV communication among their plants in ten Japanse cities which have

greatly improved communication. The network for school students has allowed wide transmission of knowledge and skills, training through simulation, and enhanced motivation for active study.

There was considerable discussion about the implications of these multimedia developments for TVE. The shift of teaching from the class to the web, from compulsory to voluntary and from being conducted in work-time to the employee's own time, all these factors enhanced flexibility.

A discussion also took place on how learning through networks could be accredited, and how specific learning required and taught by a particular employer could be given wider accreditation. Basically, the system relies on trust, but there are safeguards that can be built in.

It was considered that we were only now entering this present phase of teaching through multi-media and there is still considerable uncertainty about how it will be implemented and where it will lead.

It was agreed that science, mathematics and technology subjects were ideal for network learning. These curriculums were easy to generalise across countries and the medium suited the content because the answers were exactly fixed. It was observed that the network learning was less suitable to other subject areas and particularly, where practical "hands on" skills had to be developed.

The concept of a "virtual school" was discussed, following the "NEC Gakkos initiative" where schools throughout the world were connected by a computor network. This broadened the experience of students and permitted healthy international exchanges. The use of tools such as the "Yuki Special Programme" for developing multimedia programmes was considered to be useful in TVE;

The problem of upgrading the teachers knowledge and skills to use the new technologies was raised and a point was made that in China, for example, the first thing teachers have to do is to go through a programme to learn the new technology for themselves. Thus the issue of teacher training was critical, and it was pointed out that in some countries teachers are still questioning the effectiveness of the use of new technologies in the classroom in general.

The future role of companies currently involved in the telecommunications industry as they move into education was discussed. It was indicated that if the move into education of these companies is profitable, it will continue and challenge the traditional role of teachers.

The issue that the Web provides cascades of undifferentiated information was raised and it was emphasized that students have to develop learning techniques and competencies which allow them to exploit the new technologies effectively. Also, it was pointed out that knowledge is only useful and transferrable if it is presented in an organized manner and it requires a teacher with a good knowledge of structure and subject matter as well.

There was a debate as to whether in the future the teacher would be in control using the computer to assist, or the reverse. It was suggested that both will be required, depending on the learning context. It is also important that computer assisted teachers prepare curriculum materials and software.

With the growing tendency towards individualisation of learning, the issue of accreditation was raised. Recognition of prior learning as a basis for certification was considered as a matter of growing importance.

The effect on education becoming increasingly market-driven was also seen as an important issue. Will a training market improve quality, or will it homogenise education. Will it cause education to become the lowest common denominator of what might be acceptable, or will it narrow the values content of education. These questions have to be answered by the educators.

A big issue for all countries is the question of resources. There will have to be considerable internationalization in the development of curriculum materials, particularly in content areas which are common for many countries. It was suggested that more developed countries have a responsibility to support developing countries in this regard.

DISCUSSION ON MAJOR ISSUES

A number of issues were discussed during the meeting and formed the basis to formulate recommendation, strategies and suggestions for TVE which could be considered further by UNESCO and its Member States.

The first group of issues discussed arose from the session on multimedia. It was noted that once this initial infrastructure had been introduced, this approach is ideal to teach various TVE students more efficiently. The following major issues have been discussed:

1. Major implications of multimedia and the use of networks:

- curriculum development, teaching and accreditation of students;
- training of teachers to assist them in their changing role to support students' computer-assisted learning and development of curriculum that might become teaching software;
- meeting the needs of different countries: some curriculum is common for many countries, but sometimes it needs translation, while other curricula are highly specific for the countries.

2. The use of a multimedia or network approach to develop competencies through self-learning: Students need to develop specific skills in order to receive knowledge through this new approach to learning.

3. The financing of the development of these multimedia approaches: The implications for both developed and developing countries

4. Evaluation of students achievements through multimedia methods: How can recognition be given to learning in non-formal settings on the job or undertaken by employees?

5. The new roles of teachers: Teachers must be able to:

- assist students to develop a competency for self-learning;
- assist students to structure knowledge from the wide range of available sources so that it is transferrable and prepare them to deal effectively with a mass of information, including

sophisticated ideas.

The meeting also discussed more general issues arising from the country papers presented. The following issues were seen as important:

1. How can countries, and particularly developing ones, gain the maximum benefit from the growing internationalization of TVE, as part of the increasing globalization of the world economy?

2. What changes are necessary for the providers of TVE to fulfil their changing role, particularly in terms of their need to establish closer link among industry, enterprises and employers?

3. What is the likely impact of the growing use of information technology on TVE and its delivery, whether in formal settings, on the job, or other settings?

4. What are the broader goals of TVE beyond the development of work-related skills, for example, its contribution to self-development and personal growth, so that individuals contribute fully to society and not just to the work place?

5. How can the coordination between TVE and general education be improved providing more flexible forms of articulation between the two? This may require changing the concept of TVE and general education so that they become integrated and as far as the students are concerned, preparing them for both work and life.

6. How can the status of TVE be raised so that it takes its proper place alongside general and higher education? In the short term, this will require creating better pathways among these three sectors, and including work as well as viewing TVE itself as a form of general education preparing people for a broad range of future employment as general education is expected to do.

7. How can employers and enterprises be encouraged to fulfil their role in bringing the world of work closer to the TVE providers in a climate where more and more is being expected of them by all three education sectors? How can they better fulfil their role in co-operative projects?

During the discussion it was noted that there was a trend to develop special universities to cater for TVE students. This was the case in Saudi Arabia where they were intended specifically for TVE students, the Republic of Korea where the 'new' universities were being established as the corner-stone of TVE and in Japan, where previous 'polytechnic' type universities had endeavoured to transform into traditional universities. This second trend was noted in several countries.

The importance of vocational guidance to young people was recognized for adequate information on the various options available to them. It was reported that in some countries students were becoming increasingly attracted to TVE, since they could see how it relates more directy to employement and provides also options undertaken at university courses either by being given credit for their TVE studies or having special university courses designed for them. The opportunity to enter university for the 'maester' degree in Germany was quoted as an example.

It was pointed out that some enterprises are not aware of the various changes that have occurred in TVE systems in general and what is happening in technical colleges in particular. This was seen as a real barrier to getting better support for TVE from industry.

FIELD VISITS

Participants undertook one day visit to familiarise themselves with the vocational education system in Japan.

The morning visit was to Kuramae Technical High School, a traditional school more than 70 years old. The buildings and equipment reflect its maturity, and it provides a solid base of vocational education through a three-year course for the age group from 15 to 17 years (after 9 years of compulsory schooling). There are 600 full-time day students, of whom 37 are girls. They all do a common course depending on speciality. There is a part-time night programme for more than 200 students, those unable to attend during the day. Students pay 8,000 yen per month (US$ 80) which is the same as for the general high schools. There are 40 students per class, but students make small group around 10 for the practical training and 20 for English and Mathematics.

About 10% of the graduates go on to university, 70% go straight to work and about 15% to other higher education institutions, such as engineering colleges. All students study general subjects, and it is seen as a general vocational education. All teachers must receive pedagogical training prior to teaching in the school and none come direct from industry.

The second institution visited was the Tokyo Metropolitan Institute for Education and Technology which was the best equipped government funded institution that any one of the visitors had seen before. The intention of this institute, which costed US$ 40 million to build and equip is to raise the status of TVE in the eyes of senior secondary students and to give them opportunities for hands-on experience in the most up-to-date technology of the actual work-place. It also trains teachers, and puts through 45,000 students and 10,000 teachers each year in 3 to 5 days training programmes. The Institute has the most up-to-date industry systems for biochemical-production, computer assisted business and automated production. It has sophisticated equipment that is difficult and costly to install in schools and provides fully systems operated facilities for advanced technology that will be studied by senior high school students in the 21st century.

The third visit was to the PANASONIC Audio-Visual and Systems Square (AV&CC) which gave a presentation of state-of-the-art equipment currently available commercially. The centre-piece new technology was high-definition TV with wide screen format which was also projected in 3-dimensional quality none of the visitors had experienced before the visit. The use of digital technology in education, medicine, business and general entertainment gave a taste of what will become more popular and widely available over the next decade.

RECOMMENDATIONS

After extensive discussions on major issues, the participants spent the last day of the meeting to formulate recommendations to both UNESCO and its Member States, for further action.

The meeting agreed to make the following recommendations:

I. GENERAL ISSUES: FOR UNESCO

1. *UNESCO should be complimented for the work it has initiated to enhance TVE through the UNEVOC Project, and is being advised that this work should continue in the future. It would be very helpful if other developed countries would add resources to those already provided by Germany to allow this further development.*

   UNESCO should advise Member States to set up mechanisms which would assist them to implement special measures to improve the status of TVE and its functioning within the education industry, with particular emphasis on linking TVE to the world of work:

2. *UNESCO should continue its work to address gender and equity issues in the area of TVE so that groups which do not normally participate in training are given the opportunity to do so. In particular, strategies to enhance the opportunity for girls to undertake work in new employment fields is an important part of meeting gender needs.*

3. *UNESCO should advise on structures being used in Member States to bring together industry and TVE providers at school, industry and national levels; such structures should include representatives of TVE, industry and relevant trade unions, and other community organizations.*

4. *UNESCO may wish to determine a process for establishing competency standards that are international in areas where these are not already available.*

5. *UNESCO should develop a programme of case-studies to utilize work being done in many countries to establish competency*

standards. Also, it should advise on strategies used to involve industry and TVE providers on how to achieve consensus on key competencies.

6. *UNESCO at the highest level should seek to establish close co-operation with global companies and enterprises to strengthen their support to the TVE system in the Member States, particularly in the telecommunications arena.*

II. EDUCATIONAL ISSUES: FOR MEMBER STATES

i) **For general secondary schools:**

- to provide vocational guidance which emphasises the opportunities in the world of work and TVE programmes which lead to it;
- to arrange students to have experience in work places so that they may have a better understanding of possible work futures;
- to focus on the development of key competencies which will show potential employers what skills for work students have;
- to promote the development of integrated courses dedicated to providing a more seamless approach to general and vocational education.

ii) **For secondary vocational schools:**

- to investigate to potential for implementing a modified 'dual' system which brings together learning in the work-place with learning in school;
- to investigate other models of bringing together learning in school with learning for work for example, co-operative education.

iii) **Curriculum arrangements**

- curricula should be made more job-related with the development of key competencies at the core;

- the projects undertaken by students should relate to real situations and real work-place experience;

- extending the contents of the general education in TVE school, so that vocational education can achieve general education aims;

- programmes of work practice should be developed so that young people may enter the work-place and be productive with minimum delay.

- work skills earned at school should be given credit toward vocational credentials achieved after entering work.

More general measures

Member States should develop more effective vocational guidance programmes for students and their parents.

Member States should be advised that it is in their national interest to ensure adequate financing for TVE and its funding should be considered so that its priorities are considered along with those of universities and schools.

- The salaries of teachers of TVE need to be adequate to attract the best teachers and particularly, people from industry and TVE teachers should be available to teach in the general secondary school;

- TVE should become increasingly integrated with the school education system and university education and should be accorded the same level of attention as other sectors of education.

- Member States should ensure that their national employer agencies such as Chambers of Commerce and Industry are actively involved in bringing TVE and the world of work together;

- Teachers of TVE should be provided regularly with opportunities for direct work experience to enhance their understanding of the world of work;

- Strategies should be developed to assist the industry to provide work experience without the burden being too great for enterprises, and the organizational arrangements should be made simple;

- Employment agencies for industries should be invited to play more active role in the vocational guidance in schools.

III. BROADER ISSUES: FOR MEMBER STATES

Member States should investigate the implications of **key competencies** as are being developed in their various forms with a view to implementing them in their countries. In particular, they should review the methodology used in basic education which focuses on important competencies similar to key competencies, to determine whether this methodology can be continued into the secondary school.

Member States should be advised that significant effort will be necessary for initial and in-service teacher training for TVE teachers to meet the requirements of the world of work with regard to classroom teaching.

Attention should be paid in the Member States to the extent that the concepts of TVE are included in the basic or primary school curriculum. This should include the development of manual skills and an understanding of the nature of work.

Member States should establish appropriate data-bases that would allow industries and TVE institutions to share information, particularly about labour market opportunities.

Member States should ensure that appropriate materials relating to environmental and ecological issues are included in TVE curricula at all levels and across all major fields.

In order to assist people enter the more competitive economic environment, TVE curricula should incorporate the development of entrepreneurial skills and an understanding of the competitive business world.

IV. MULTI-MEDIA ISSUES: FOR UNESCO AND THE MEMBER STATES

UNESCO and the Member States should bring together representatives of TVE providers from the education industry with companies in the field of telecommunications, multi-media and software development so that the new technologies can be used more effectively in TVE.

Companies developing software in fields that may be transferrable across countries (e.g. in mathematics, sciences, technology, business studies, etc.) should be invited by UNESCO to produce generalizable curriculum materials. UNESCO/UNEVOC should set up strategies, particularly with

developing countries, to make this possible.

UNESCO should work with the Member States to see whether joint financing of curriculum development in TVE or translation of materials that may improve the cost effectiveness of curriculum development.

UNESCO/UNEVOC should develop strategies to produce simulations of key work experiences which may be used in various countries. Simulation is seen as an important way to reduce the cost of practical experience.

The UNEVOC Project should undertake case-studies on various ways of integrating multi-media methods and material into the TVE curriculum.

UNESCO should promote the production of educational materials by companies developing multi-media materials (for example, some countries provide tax relief).

Since a number of countries implement the dual system of TVE and training by the school and the industry, the UNEVOC project could advise on how to use more effectively multi-media methods and materials so as to serve both the needs of on-and-off the job training.

ACKNOWLEDGEMENT

During the closing session, all participants expressed their satisfaction of the great success of this meeting. They were all very pleased to have this opportunity to exchange their ideas and experience on such an important topic in technical and vocational education.

On behalf of the participants, Dr. Ramsey expressed sincere gratitude to the Japanese Ministry of Education, Science, Sports and Culture (MONBUSHO) for hosting this event and to the Japanese National Association of Technical High School Principals for their generous sponsorship. The warm hospitality extended to all participants made their short stay in Japan a wonderful experience.

The contribution towards this event made by the late Miss Akemi Fujiu, a Japanese Associate Expert who worked in UNESCO from 1994-1995 was also mentioned and highly appreciated by the participants.

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International Trends and Developments in Technical and Vocational Education

by

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INTRODUCTION

The enhanced focus on technical and vocational education (TVE) in most developed countries, and particularly those striving for a more competitive market for their goods and services, is now more than a decade old. The stimulus for this enhancement stems from a number of sources:

- the rapid internationalisation of the world economy;
- the increased emphasis on competition and the development of global markets;
- the need for increased quality in goods and services if enterprises are to be competitive;
- the changing role of governments as they move away from providing services directly to concentrate on funding and control; and
- the increased emphasis on "user pays" for government provided services, including education.

Developing countries have not been slow to take up some of these trends in the establishment of their own TVE systems. Where developed countries such as UK, Australia, Germany have had to face the difficult task of changing established and entrenched systems in a climate of budget constraint, developing countries have been able to expand their systems or put in place new ones using the best ideas in TVE from around the world without the inhibiting effect of conservatism slowing change.

Most developed countries have had to couch change in terms of some kind of reform agenda which has required a considerable shift in the way TVE is to operate. Most countries are bringing about changes which are consistent with the following guiding principles for technical and vocational education and training:

- the training must be industry focussed through strong partnerships (links) between the training providers and the industries and enterprises they serve;
- the training must be provided where it is needed, whether on the job, at home, or in a formal training institution;
- the curriculum must be flexible and able to be delivered in a range of settings, so is modular; providing close direction to the student and teacher;
- the training is competency based so that employers are clear about what people can do; and
- there is a consistent system of certification which guarantees quality as well as transportability of skill. (National standards in various forms are now common.)

The extent to which the economic turmoil of the 80s with the October 1987 stock market crash caused a radical rethink is not clear. It did, however, cause a sharper realisation of the difference between real money, generated by enhanced skills which add genuine value to what an enterprise does, and paper money which has more to do with asset stripping and repositioning and little to do with the overall improvement of an enterprise. Coupled with this have been significant changes in labour market trends. Those who are more skilled are more likely to remain employed or find new employment, so training for the whole workforce has become critical. The need to improve quality to best international standards has required a higher level of skill than had been the tradition on the shop floor or manufacturing line. Work practices are changing, requiring people who are able to use an increasingly sophisticated technology.

Some of these changes caused countries to examine where education dollars were most effectively spent. The support for university education and the fostering of an elite education system was called into question when countries with such approaches discovered they were less globally competitive than countries which provided much more extensive formal and informal education and training for the bulk of the workforce. The

United Kingdom and Australia are examples of the first, while Japan and Germany are examples of the second. The realisation is growing that the mark of a clever country and one that will be internationally competitive, is a country which has educated the bulk of its citizens to a significant level, providing appropriate training to make their workforce at all levels highly skilled. A country's economic health is better sustained if education and training is provided to the whole potential workforce, rather than more and more resources being applied to those already advantaged, which is the trend in an elite system focussed mainly on universities.

CURRENT TRENDS IN THE DEVELOPMENT OF TVE

As with most changes, through global communications and meetings such as this, ideas from one part of the world very quickly become part of a change agenda in another. Not that proposals from one country are implemented unchanged in others. Rather, the idea is taken up and own country solutions proposed which modify the original to suit the new environment. This has particularly proven to be the case with TVE, for example with the German dual system being modified in other countries such as Indonesia, and the UK national qualifications frameworks being modified in countries like Australia, New Zealand and Mexico.

Generalisable Skills

Another example of a good idea being taken up almost simultaneously in several countries is the issue of generalised workplace skills which are expected to apply irrespective of the nature of the workplace environment. Various countries have their own names for them: for example, in the English speaking world they are called Essential Skills in New Zealand, Core Skills in the UK, SCANS skills (Senate Commission on Achieving Necessary Skills) in the US and Key Competencies in Australia.

Although each of the schemes differs on the margin, they have similar skill areas and the emphasis and intent is comparable. The essential aim of an education system based on competencies is to know what people can do, so that they may be better prepared for work. This is a very different aim from the more traditional content knowledge assessment which occurs in schools at the end of say, twelve years of schooling.

The key competencies are skills that good teachers always developed and are the skills required in the workforces of the next century. Those who have the skills will be employable, they are inculcated in economically rich environments, so unless we are careful, the poor and disadvantaged will be denied them. Attitudes and values about work do underpin them, but they are not supported at least explicitly by values about other things, for example, the arts, literature and music. Issues related to key competencies come to the core of the kind of society we want.

The Australian Key Competencies are:

- collecting, analysing and organising information;
- communicating ideas and information;
- planning and organising activities;
- working with others and in teams;
- using mathematical ideas and techniques;
- solving problems;
- using technology.

An eighth, cultural understanding, has particular poignancy with the recent debate in Australia about its cultural mix. This debate has brought into harsh relief the issue of people's attitudes and values and although it is essential to develop skills in people, they are not of themselves sufficient for an effective workforce. We are becoming increasingly aware that the skills we develop through TVE will be used by people who have particular value sets. So any development of skill must be paralleled by the development of people as people: their attitudes, values and appreciations. A skill developed in a person is not value free and this skill:value dichotomy requiring the development of the whole person will become increasingly an issue for all our countries and their education systems. Such development is an important component of lifelong education, which is a key UNESCO theme.

As TVE curricula become increasingly industry driven, the development of the skills to serve industry is critical. But so also is the development of the attitudes and values we expect of our citizens. Employers are only now beginning to see that both can influence the bottom line or profit, not just the skill. To give an example, a workplace where there is racial disharmony (in some workplaces in Australia there are as many as 18 different languages spoken with similar divergence in cultural background) will be an inefficient workplace.

The trend toward identifying generalisable skills and assessing people as to the sub-skills they have in each category or the level and depth to which they have acquired the skill will be an area of considerable development internationally. Such an approach challenges traditional content curricula and will influence dramatically what is to be taught in schools, as a precursor to more specific vocational education.

TVE in Schools

In most countries, the number of young people staying on at school is increasing. In many developed countries, more than 80 per cent of the entering cohort of children stay for a full 12 years. To look at this fact the other way round, in Australia in 1966 about 60 per cent of 15-19 year olds were in full time work. By now it is down as low as 18 per cent. This is a dramatic shift of load to schools, and I think it is fair to say that schools were generally slow to modify their curricula to meet the needs of their new clientele.

An important approach internationally has been to make the school curriculum in the senior years more job skill related. This is not so much to give school students work experience; rather it must involve developing higher order capacities in the whole year 11 and 12 cohort that previously had been reserved for the 20 or so per cent who stayed on beyond the compulsory school leaving age. This challenges many of our entrenched ideas about intelligence and the ranking of students and which students can learn which content. Addressing the needs of this new clientele has been attempted in a number of ways. Unfortunately, school teachers are ill equipped to meet the new expectations to develop the skills needed for the new world of work and change has generally been slow.

Countries are experimenting with providing a whole range of different pathways from school to work, such as:

Compulsory school ⟷ technical and vocational education ⟷ work

post compulsory school ⟷ professional education (university) ⟷ work

post compulsory school ⟷ technical vocational education / professional education (university) ⟷ work

post compulsory ↔ technical and ↔ work ↔ professional education ↔ work ↔ skills
school vocational education (university) upgrading

The arrow is intended to represent the increased blurring of this interface and that increasingly both will occur together.

Each of the transition points is increasingly synergistic and less sharply defined as learning and working occur sometimes separately, sometimes together. Not that much of this is new: it is just that it is being applied more widely across the range of employment possibilities. The big issue in all of this is the increasing role of industry and the enterprises that employ people in technical and vocational education. For work and learning to be more effectively integrated, there must be close collaboration between employers and the providers of training.

Schools, particularly in the post compulsory years, will need to become employment placement centres working closely with industry to begin preparing young people for the work they may be expected to undertake. Schools often forget that the next step for a significant proportion of students in the final years of schooling is in fact to look for work, not further study.

The role of industry

Some sections of industry have always been heavily involved in TVE with the traditional apprenticeship being the back bone of the relationship between training providers and employers. Many countries have endeavoured to expand apprenticeship systems to new industries and to make them more attuned to developing relevant skills and competencies rather than simply "serving their time".

The intended expansion has been rather slow and has not taken into account the stage of development of many industries and enterprises. More importantly, to support an apprentice or trainee is costly for an enterprise, and particularly a small one with very little in the way of spare resources. This raises the question as to whether all the training resources should be in the hands of the provider, and whether at least some of these resources should go to the enterprise to pay for their contribution to training. Obviously, if at the end of the training the person will not be employed by the enterprise, there is a stronger case for some support. This is particularly so for work experience which may be

part of school or where exemplary enterprises are used to train people.

The problems of providing training in small businesses and enterprises is a pertinent one for both developed and developing countries. In many countries more than 80 per cent of the workforce are employed in enterprises with 20 or fewer staff. With increasing contracting out of services and a general push to down size, the trend to small business is likely to increase. A critical issue is to draw small business into the training arena. Needs of small business vary widely. For some, training is needed for a highly specific product or service. For others, training is needed to develop multi-skilling and flexibility so that they can undertake a range of tasks. The training and the work can readily be separated, and be undertaken either on or off the job or a mixture of both.

For some enterprises that are at the cutting edge either of product development or service provision, learning is actually part of decision making and is about problem solving and entrepreneurial skills. This approach requires a very different training response and is part of developing a learning organisation where learning and working are an integrated whole.

To parallel the increased focus on industry, most countries are expanding, or allowing to expand, the provision of training by private organisations. This allows the opportunity for more efficient delivery when compared with the government provider, but more importantly, offers a real choice both to the potential student and the employer. Such an approach starts to create a training market, with education and training beginning to develop the hallmarks of an "industry in the making". Different countries are at various stages in the development of a training market and some questions are being raised to be sure that TVE provision is not weakened when a market begins to take hold. Some of the concerns include ensuring:

- the quality of the training;
- that a real choice be presented to clients;
- that equity objectives continue to be met;
- that TVE is still offered in cases where it would be very uneconomic, for example, in small towns and distant regions.

The relationships between training providers and industries may be summarised in terms of the following principles that have some generalisability across countries and have influenced the development and provision of TVE:

- sharing more fairly the costs of training among the individual, the enterprise or industry and the government;
- increasing industry ownership of the traineeship system with enhanced stakeholder input to major decisions;
- providing a more streamlined system of regulation of providers and of credentials;
- expanding training opportunities so that they are more evenly spread across the whole workforce meeting the needs of all enterprises more equitably;
- ensuring that equity and access considerations are fairly applied;
- providing a national framework within which the training system operates;
- enhancing the quality of the training system, particularly through benchmarking both in country and across countries; and
- increasing internationalisation of training driven by global markets and enterprises.

As industries change, so will the training required to serve their needs. Much is occurring now which will provide a stable base for future TVE development. Relationships between TVE and industry will be influenced by the requirements of global enterprises on the one hand and the needs of small business, often with a very local clientele on the other. Do large global enterprises for example, need large global training organisations to respond to their needs in the way large companies require big banks to finance their investment? Can large training organisations meet the needs of small businesses and industries, or is that better done by one of smaller size? Some of these issues will be resolved as the competing forces from the training market take effect. Where there are gaps, government agencies will need to step in to ensure that a country's training needs are met. Competition alone, at least in the short term, is unlikely to do it.

The Delivery of TVE

As other industries and enterprises become more global in emphasis and reach, so also will the education and training industry. Already

developed countries particularly are making their education and training services available to other countries, either by attracting overseas students to their countries, working in the overseas country or offering courses by distance techniques. Knowledge and information is now available anywhere, at any time through the world wide web and increasingly education and training organisations will be global in their reach.

Increasingly, too, industries are looking to meet international standards of good practice, and in the case of some industries, where the achieving of common ends and outcomes is sought. For example, aviation and telecommunications, the actual standards and training techniques are common internationally.

The trend is increasingly to deliver the training service where it is needed and to provide materials that are specific to certain outcomes or requirements. Because flexibility is in such high demand, courses tend to be modular, put together in ways which suit the specific individual's needs, and particularly their employment circumstances. This raises an important equity issue: how can we be certain that an employer will allow an employee to undertake what is best for them as opposed to what may be best for the firm.

Standard course lengths and standard course content are under challenge, as students with their employers work out what is best for them. It might be three modules over three months, it might be 24 over two years. No longer is training provided upfront, from which the person is then prepared for that specific employment for the rest of their life. Any learning is part of a lifelong engagement with a learning process, some of which will be formal, some informal.

People will develop skills in different ways, and the concept of recognition of prior learning (RPL) as it is known in Australia or accredited prior learning (ARL) as it is known in the UK become increasingly significant. Modular programmes when used in formal classrooms with people who have credit for a wide range of previous learning, challenges the traditional concept of a classroom of learners with a teacher working through a set curriculum. The teacher becomes the assessor of previous knowledge, the designer of a relevant learning programme (by advising on appropriate modules), the guide to the learner as they work through the modules. Parallelling this more formal training is the essential liaison with the learner's workplace. Training is

becoming a highly complex business.

The development of curriculum to meet these much more complex requirements is expensive and time consuming: in fact it is pointing to a position where the whole concept of curriculum in TVE is changing and it may not be a helpful word much longer. Many countries are adopting a national approach to curriculum development, to meet national outcome standards consistent with world best practice. Many curricula developed in one country are accepted by or are modified for use in another. This makes economic sense and no doubt the trend will continue. There are clearing houses of materials, such as at the UNEVOC Centre at the Adelaide Institute of TAFE where they are made available for wider perusal. Increasingly, too, the world wide web will be a source of curriculum and will provide a process whereby curricula can be developed jointly both within countries and across countries. Soon teachers will be able to pick and choose from among curricula generated in many countries round the world, subject of course to the limitations of language.

The influence on curriculum of learning in the workplace is a matter of some research and much discussion. The central issue is to determine what is best learned in the workplace and what would be better undertaken in a more formal setting with a teacher and a group of students with more diverse backgrounds and employment experience.

The issue about who should make the learning decision is a critical one. The closer to the workplace the learning is undertaken, then the more likely will the employer influence what is learned. Also, an employer is less likely to support a learning program which is more general in its application, or directed at the employee finding a better job, probably with another employer.

Another dilemma is emerging as well. Curriculum development is expensive and is usually undertaken by Government agencies. As private providers come increasingly into the picture and a market develops, what are the terms on which these curricula should be made available? Should they be free, a modest change imposed, or a price determined consistent with cost recovery? What are the implications of social justice when a fee is charged? For example, in my country government schooling up to year 12 is essentially free. A person who leaves school after year 10 and returns to TVE some time later will be required to pay a fee even though

they have not received the equivalent of 12 years of education free, as would those students who proceed to university.

Similarly, government provided facilities could be used (hired?) by private providers, either at times of the day, week or year when they are not being used by the public provider, or in competition with the public provider where the private provider can offer the service more cheaply. Like most boundaries we have in education, the public:private provider can be quite a blurred one as public providers privatise some sections of their operations and private providers gain many of the benefits of public funding and support that previously had only been available to the government provider.

As soon as a training market develops, processes must be put in place either to accredit and hence assure the quality of courses offered by private providers or have a system of registration of the private provider so that the public can be assured of the quality of what they do. These safeguards can be expensive, and if the process of registration or accreditation is long, be seen to be obstructive to an organisation endeavouring to deliver training to meet a specific market. Different countries are grappling with these issues in different ways, with varying mixtures of "heavy hand" and "light touch" by government agencies. There is still much to discuss about where governments should be involved and where it is best to step back leaving it to the market to determine who will attract the clients with the normal "caveat emptor" warning to the potential buyer of the service on offer. One thing is critical, governments must ensure that private providers, and public ones as well, if they are receiving government funding, must have in place acceptable quality improvement systems.

Staff Development

The rate of change in TVE world wide is such that many countries are endeavouring to provide programmes of staff development to assist them come to terms with what is occurring. Apart from dramatic changes in teaching methods and techniques that may be applied within the classroom, other matters loom large for teachers and it is important that they receive some help in their understanding of issues. Some of these include:

- Teaching in a fee for service environment;

- making the public provider more competitive;
- benchmarking their activities to assist in improvement;
- understanding research techniques, methods and findings;
- teaching a much more diverse clientele;
- implementing recognition of prior learning;
- teaching and learning in the workplace; and
- developing management skills.

Some countries have developed national approaches to staff development with fully worked out strategic plans. It is important to note that as part of an industry, education and training enterprises need training as much as any other industry. In a sense, the education industry should be an exemplar of good practice in training for other industries. Too rarely can it be said that this is so. Indeed TVE provides far less opportunity for training for its teaching staff than does the university sector.

Any national strategy for staff development should have objectives aspiring to:

- increase the quantity of staff development and the resources devoted to it;
- improve the quality of staff development;
- address specific equity requirements;
- support training reform; and
- promote best practice in staff development.

As in any other industry, staff development should be undertaken directly in the workplace where that is most effective. A suitable balance needs to be struck between on and off the job training and formal and informal development programmes. An over arching principle ought to be that the staff development is directed at improving some aspect of what is happening in the teacher s workplace. The planning of any staff development activity should include a strategy for disseminating more widely what has been learned or implementing changes as a result of the program. Staff development activities must affect not only the individuals involved but activities in the workplace as well.

Organisation and Management of TVE

The reforms that are occurring in TVE are more far reaching than those occurring in schools and universities, and this is a global phenomenon.

In most countries, the status of TVE providers is low when compared with other sectors of education, so change can be imposed by ministerial fiat without the organised opposition that can so readily be mustered by schools and universities.

No more than a decade ago, TVE was mainly delivered by public providers with a few specialist areas being the subject of private provision. Aviation, some areas of commerce, retailing to name a few. The public providers were part of a government department, either within a broader education portfolio, or separate from it. The institutions were administered as if they were "grown up schools".

With the coming of the training reforms, many countries instituted enquiries and reviews of their TVE systems. These reviews were undertaken in the light of attempts to create a market situation with both public and private providers, looking to achieve a national policy and strategy for TVE to meet the more competitive economic environment, having training employer driven, and introducing greater flexibility in the content and delivery of courses.

Countries have introduced boards of vocational education and training to advise governments, training advising bodies such as the Training Enterprise Councils (TECs) in the UK and the Industry Training Advisory Boards (ITABs) in Australia to advise the providers of vocational education of their industry's needs. In addition, regulatory authorities to develop national competency standards were established as well as accreditation bodies to be responsible for course quality and registration of providers. This made for a very complex system which at least in Australia was seen by industry as cumbersome and difficult to comprehend, and steps have been taken to make the system simpler.

Public providers in some countries were seen to be unresponsive to the real needs of enterprises, and a reason given for this was that they had a monopoly and hence were not encouraged to be efficient.

There were two approaches to resolve this dilemma: one was to introduce or support with some government funding, private providers to act as genuine competition. The second was to give individual TVE institutions some degree of autonomy to enable them to compete with each other for students and for funds from both the Government and from the private sector. In a sense, large systems were cut up into smaller

providers that had to be competitive to survive. Whether a Government would allow a public provider to go broke and hence disappear is still very much to be tested, but we are in early days yet.

This move to a large number of relatively small educational businesses is against the trend in other industries for consolidation to a few major providers that often then become global in their reach. There are signs that educational institutions will come together to make larger networks both within and across countries. The extent to which the supermarket chain model as opposed to the corner store model will predominate is still open in the TVE arena. There is no doubt that as more and more government money for training is put up for open tender, major global players in say the communications industry will become interested in providing TVE. After all, TVE is a multi-billion dollar industry in most of our countries, and if these funds become truly contestable, then major global enterprises are unlikely to stand back and watch, and in the process leave education to the educators. Some of the global changes we have seen in, for example, sport with global rugby and soccer or in banking with their consolidations and changes in the delivering of their services may well come in TVE.

The situation which evolves in the TVE industry may well parallel what occurred in other industries: there will be niche market providers that come and go, with major global educational enterprises that provide the bulk of the world s TVE. We are a long way from this state of affairs yet, but the signs are that the world is moving in this direction. Another possibility that already shows some signs of life is the "franchise" model where locally owned providers conform to a set of central standards to guarantee a product irrespective of where it is offered.

Some of these organisational changes will demand managers who have been as well prepared as managers in any other industry. They will have to become resource conscious, able to manage in a competitive environment. The secret of success in the new order will be service to clients, where the organisation will operate as an efficient business. Few countries have the educational leaders and managers to institute these changes effectively, and there may be merit in attracting managers from other industries, but rates of pay and conditions in TVE do not make such a move particularly appealing.

To conclude this section it is important to understand current thinking about how governments should operate. There is now an attempt to divide the activities of government into steerers and rowers. The steerers develop policy, allocate resources, monitor performance and generally keep the ship moving in the direction governments require. The rowers on the other hand deliver the service, spend the money, implement the policy and meet performance objectives.

How valid such a distinction is provides much room for debate. On the one hand to separate the two prevents conflict; for example, to develop policies which make things easier for the rowers rather than to serve the clients. On the other hand, how can good policy be made without detailed knowledge of how things operate and what is feasible.

There are some in Government who would contract out all the rowing: that is, the provision of a service is not the business of Government, it is the business of those who are prepared to take a fee to provide the service in competition with others. Indeed there are those who say governments should only become involved in the activities of the community when there is market failure or to provide social equity, and it is only through competition that governments can be sure they are getting an efficient service.

Many of these ideas underpin the directions for reform and it will be interesting in the decade ahead to see how issues are resolved. Yet we might ask whether competition is the only way to make a Government service efficient. What about natural monopolies like airports, how do we know they are efficient and we might ask whether education and training is similar. Each country will have to work these issues through to meet their own understanding of the role of government in TVE.

MODALITIES OF LINKAGES BETWEEN TVE AND THE WORLD OF WORK

The changing world of work and implications for TVE

Technical and vocational education is fundamental to the world of work. For most people, work is the desired outcome of their education and it is through their work that people are fulfilled. The nature of a person's work defines who they are and people out of work are severely limited

in terms of the kind of person they may become. In the developed world there has been too little written about work as it must become: a process through which individuals express themselves and for which they gain some reward.

A big issue for all countries is the nature of work, how it can be shared, how people can do the work they do more effectively, and how to bring into meaningful work those who are currently being denied access. In many developed countries, even though they may have single digit unemployment (in Australia about 8 per cent) the proportion of youth unemployed reaches as high as 25 per cent of the age group as it does in my country, despite the increased numbers staying on at school.

Major issues relating to the world of work, where TVE must play a major role in providing solutions include:

- what changes should be made to school curricula at all levels so that young people are more work orientated and have the base skills needed for productive work;
- how can employers, who in effect own the work, be more involved in helping into the workforce those who need to work;
- how can work be shared more equitably among those who are in work and who are working increasingly longer hours, with those who do not;
- how can people in work continue to maintain an appropriate level of skill throughout their lives and be fortified against those changes in skill need, which would make them redundant;
- how can people in initial pre-work training or in work itself be given sufficient understanding of and skill in new technologies so that they can use them comfortably in the workplace and accept readily the technological changes that will come;
- who should pay for which training: the individual, the employer or the government;
- how can young people be financially supported while they are undertaking their training;
- how can older people who find themselves out of work and who become the new poor be better supported in their need to find new work;
- if high levels of unemployment continue, how is training for the unemployed to be managed; and
- how should work be managed and organised so that it is more

fulfilling to the worker and incorporates appropriate training to develop an enterprise as a learning organisation.

Not that any of these questions are new. Their resolution will indeed be positive for people, not negative. Countries are grappling with their implications and are putting in place possible solutions. It is essential that individual countries know "what works" particularly in countries where there are major similarities. In this context, I have been asked to focus on possible modalities of linkages between TVE and the world of work, giving Australian examples. There are many areas I could focus on, but I will confine myself to the school to work transition which is an important issue in all our countries and where in Australia we are to implement a new system intended to get more young people into work.

Approaches to dealing with the young unemployed

Industries generally have been supportive of an apprenticeship system and in the narrow range of vocations where it has been applied, the process has worked well. With the German model in mind, over the past decade, countries have endeavoured to expand this system to include traineeships so that most areas of work could use an apprenticeship/traineeship system as the method of entry into the workforce. Australia endeavoured to expand its apprenticeship system in the late 80 s by adding traineeships, but met considerable employer resistance so that only about 22,000 of a target of 70,000 trainees per year were ever filled. Some of the reasons were the lack of preparedness of employers, small business found it costly, and the system required close co-operation between the training organisation and the employer. This last had not been the tradition in many of the areas where traineeships were intended to be introduced.

Paralleling this attempt to prepare people for work, those young people who were unemployed were given so called "labour market programmes" in an attempt to provide them with work skills. These might include literacy and numeracy skills, computing skills or low level technical skills which should make them more attractive to potential employers. Unfortunately, with work in short supply there were always others who were more attractive to employers even when they were hiring. So, such labour market programmes were seen largely to fail the young unemployed who could see little point in them when they led neither to jobs nor to accredited outcomes. While there were many important exceptions, with the labour market programme providing the start, in

these constrained economic times they did little more than keep the unemployed off the streets.

One of the ingredients seen to be missing from these programmes was a commitment by an employer to a young unemployed person. They were supply side courses rather than demand side work related training. Faced with this dilemma, the Australian Government (the new Liberal Government which came to power early last year) is introducing a new scheme currently called the Modern Australian Apprenticeship and Training System (MAATS). Other countries are looking at their own systems, and what is happening in Australia may form a useful benchmark in other places.

MAATS

The Modern Australian Apprenticeship and Traineeship Scheme (MAATS) is a key Australian Government initiative to make employment based training more attractive to employers. It aims to provide a "light touch" by government through de-regulation and streamlining. The objective is to greatly expand employment and career opportunities for young people.

The core of the scheme is that it will be industry led, with enterprises given a greater range of choice as to the kind of training arrangements they require and being involved in determining them. The intention, too, is to offer a national training framework with national training packages developed based on national standards, qualifications and assessment strategies.

This national approach is a very big step in Australian education and training which has been traditionally state based with state standards and state control. What the government is proposing is a national system with national standards. Already all the states have signed on to prepare for the introduction of the scheme in 1998. There are industrial relations implications and it is intended that MAATS will be negotiated within a framework of Australian Workplace Agreements which are part of new Workplace Relations legislation.

In the MAATS proposal, employers and their employees (the apprentices and trainees that are employed) will come to an agreement on a training

programme drawn from the nationally endorsed Training Packages. Although no doubt potential providers of the training programmes will be involved in this process, it is clear that the decision making power is with the employer.

An essential element of MAATS is a parallel system of incentives for employers to take on apprentices and trainees. This requires regional and community involvement and support systems are proposed to bring it about. Regional and Community Employment Council's (RCECs) are to be established to focus industry support in a region and help to overcome the general reluctance of industry to be involved in training. The administration of the training arrangements will become the responsibility of Contracted Entry Level Training Agencies (CELTAS) to provide a "one stop shop" for the administration of the apprenticeships and traineeships. These agencies may be either public or private and will be determined by tender.

There is within the system a considerable attempt to focus on small business to encourage more and more such enterprises to have responsibility for training. Group Training Companies (GTCs), which have developed in Australia over the past several years will expand their role so that groups of apprentices/trainees can be contracted out to different, usually small, employers thus making available a broader range of employment experience. These GTCs are incorporated private enterprises that employ staff and operate in all aspects as a business except they received significant government subsidies. They are in effect employment brokers contracting out the services of the apprentices and trainees they employ to other enterprises: it is likely that they will have an increasing role in the operation of the MAATS scheme as it develops.

Both public and private providers will offer training; so in effect employers will be able to choose from a range of potential deliverers. While this approach is feasible in major population centres, it will be less likely in remote areas where the Government provider may well be the only one available. Of course, with new and improved technology, delivery at a distance, directly in the workplace will change the whole way apprenticeship and traineeship programmes are offered.

A consequence of the national approach is that the states and territories will abolish the "declaration of vocations" which had previously been a state by state matter and will dismantle their own apprenticeship and

traineeship industrial and training arrangements. Only one state: the largest, NSW has not agreed to this.

An important new approach in the MAATS scheme is that the system will allow students to combine a paid apprenticeship or traineeship (they will be paid for the work they do, not the time they spend in "off the job" training) with the final years of schooling. Previously, a person would have to have left school before they could take up an apprenticeship or traineeship. Apprentices will be able to complete their secondary school certificate (end of 12 years of schooling) while undertaking their vocational programme. Schools, employers, training providers and students are able to decide the best package of school, work and training. For example, a student may spend two or three days a week working or may do the work component in the school holidays. This is intended to smooth the school to work transition for those who do not wish to study full time.

In Australia up to 30 per cent of secondary students work part time and so the work these students do may count toward the requirements for their traineeship or apprenticeship. It also provides a positive path and incentive for the first time at least in recent years, for the up to 30 per cent of students depending on the region who drop out before completing Year 12.

This is the bare bones of the scheme, and 1997 is the year to prepare for its implementation. The key to the success of the scheme is the involvement of employers to give at least part time work to young people where they have not given work before. A positive aspect of the scheme for providers who have borne the brunt at least in my country of criticism relating to the irrelevance to industry needs of many training programs, is that in this case success or failure will rest squarely on the employers. The scheme is also mindful that access and equity must be considered a key element, because it is the socially disadvantaged who are usually unemployed. A mark of success of the scheme will be whether it provides enhanced employment opportunities for this group, giving them access to quality training outcomes.

The MAATS approach is a classic example of user choice, with the issue of "user pays" only beginning to be addressed. There are safeguards to be put in place to ensure maintenance of quality provision, particularly with new providers in the training scene. Teachers will need

considerable staff development support to operate in the new environment. MAATS is a bold stroke at a time when bold strokes were needed to deal with youth unemployment. At this early stage MAATS has been reasonably well received and other countries no doubt will watch with interest as the scheme is implemented. My one hope is that the system is given a reasonable time to prove itself, and that there is no dramatic change should there be a change of government. Too often in democracies such as Australia where governments change frequently, initiatives of the previous government are changed before they have time to prove themselves.

The whole MAATS approach does raise the issue of the preparation for vocations in the university arena. Should a similar approach to MAATS be applied here? Many MAATS traineeships will be quite short, but probably many university courses are too long. There will need to be some continuity between what happens in the new apprenticeship/traineeship system and what occurs in universities. After all, universities train people as well, but that debate can be left for another day.

FUTURE STRATEGIES AND POLICIES TO FACILITATE THE LINK BETWEEN TVE AND THE WORLD OF WORK

Relationships between TVE and Work

The relationship between providers of TVE and the world of work has traditionally in many countries not been a close one. If there is a generalised expectation of employers then it is that people gain their formal training separate from work and it is for the employer to use the person with particular skills to their best advantage. There have been exceptions: good apprenticeship systems had allowed close relationships to develop; some large employers, for example, BHP in my country, had their own major training systems. This is also true in the armed services, the police, airlines and telecommunications companies. But by no means was the TVE system industry driven, which is one of the major planks of the training reform agenda currently being implemented.

Although much has been said about the importance of developing the human capital of an organisation, in practice it has been given nowhere near the emphasis when compared with the development of a company's

capital resource base. Rarely are there education and training experts on company boards, whereas it would be unusual for a major company not to have financiers, economists and people with legal expertise on such boards.

All this is in the process of changing. Companies are now well aware that their competitiveness depends upon the level of skill of their employers; that firm specific multi-skilling is essential and that higher order problem solving skills are increasingly important at all levels in the workforce. This change has caused enterprises and industries to take a much closer interest in what suppliers of education and training and particularly government ones, have on offer.

In countries where the tradition has been for the individual to gain a qualification before employment, and where there has been an historic dependence on the economy to produce unprocessed or low technology goods, the workplace has been very much separate from those providing training. But as these firms become more internationally competitive, and where they move into other countries to produce goods and services, so enterprises are forced to examine their training programs to ensure their staff have internationally competitive skills. The link between training and the workplace becomes a natural force to improve what each is doing and might do for the other.

In addition, as large enterprises, often originating in developed countries, move in to fulfil major infrastructure projects in developing countries, for example, roads, aviation support, electricity distribution and telecommunications, it is critical that training programs are put in place to develop the skills of the people from the developing country who are to work on the projects and eventually be responsible for providing the service on an ongoing basis. This process provides an important mechanism for raising the skill levels of developing countries.

Levels of Interaction

There are various levels of interaction between industry, enterprises and the world of work on the one hand and the suppliers of training on the other. At the lowest level, the individual apprentice, trainee or full time worker, their employer and the supplier of training, there can be a range of formal and informal interactions. A simple agreement between the three with each contracting to fulfil particular requirements is an

important starting point. In such circumstances, the more the off and on the job training is part of an integrated whole, understood by all parties, the more effective it will be.

A second level is for several employers, usually small employers, who group together in a particular region to offer training on the job to groups of trainees and apprentices and to work together to advise training providers of their needs. These groups of employers may form associations, or establish a business education round table organisations where issues of training in a particular region may be discussed.

At this second level, involvement of industry in the operation of the training supplier is essential. If the training institution is autonomous, there should be industry representatives on its governing board. Industry should be represented on course committees, and they should provide advice about the direction the industry is moving and hence on new directions for training. If the institution is part of a government department, there still should be advisory systems established which allow industry to contribute to decisions at the local or regional level. Above all, members working in the industry should be available for part-time employment to bring a practical and hands on knowledge to the teaching programme.

A third level is for particular major industry groups to form industry training advisory bodies, where the needs of a whole industry, be it manufacturing, agriculture, mining, human services, hospitality, business and computing, may be focussed upon so that appropriate national modules may be developed with the full support of the industry, where particular courses may be examined, and where issues of on the job and off-the-job training in that particular industry may be assessed.

With this approach it is not easy to satisfy the needs of all industry groups. For example, the fishing industry is often associated with agriculture, but their needs may be very different; or the printing trades with other forms of communication. Despite the difficulties, these bodes have brought into much clearer focus what can be achieved within an industry driven approach to training.

Another issue concerning such bodies is whether governments should provide the impetus for their establishment, or whether the industries should be free to associate with whom so ever they please. Where the

association is natural, building on bodies already in existence, these industry bodies have proven quite successful. Where the association has been forced, the gains have been much slower.

It is also necessary to draw attention to the difference between an industry, which we can view as an area where goods of a specific kind are produced or a specialised service provided, and an enterprise, which is the legal entity, the organisation that makes the profit from its activities and would have to pay for the training. Enterprises may be multi-industry; a single focus industry such as mining may well require people to service them from other industries such as computing or business. As enterprises strive to become learning organisations, so they will themselves wish to develop training strategies and programmes which suit the needs of their enterprise first, and the industry second.

The concept of an industry was much more relevant to training when the preparation was separate from and prior to employment. As soon as training while working becomes the norm, then the role of the enterprise becomes much more important and changes the nature of the concept of industry driven training. This is an issue that will have to be worked through in the period ahead.

The fourth level is the level of the country, or the level at which major decisions are made by government. If training is to be industry driven, then representatives of industry must be available to advise governments on industry needs, either in collaboration with education and training providers, or separately. So called national lobby groups can perform this function, for example, associations representing mining companies, farmers, engineers and so on. But these simply present governments with a set of wishes, and the ordering of them must take place within a government department. Also, the question always has to be asked, who represents an industry? They are composed of such diverse groups, often with competing claims for training funds, that "industry driven" is a difficult concept to implement.

Enterprises take their needs to government either through associations like the top 100 companies, through chambers of commerce or associations of small business. Many of these, however, have only limited understanding of the training industry, which is almost never represented on these bodies even though they have as members those from every other kind of business activity. This should change as more and more

training becomes privatised.

Some countries have business education round tables at a national level where representations of educational institutions and enterprises come together to discuss issues of mutual concern and interest. If there has been no tradition of such an association it can take some time before they are productive. Also, many enterprises are more interested in school and university education, and so issues related to training come rather low down on the agenda.

A national TVE body

Of greater interest at the national level are the various approaches to providing more formal advice to government from bodies which have statutory authority status and have industries and enterprises, unions, suppliers of education, training and governments represented on them. These range from formal commissions which may have responsibility both to advise government and to manage the system on which they are advising, to advisory boards which provide advice on issues that governments see as important, with the management of the TVE system remaining with the government. As a general rule, the more the system is funded by governments, then the greater is the level of government control. In the training arena, there are various targets being set for the proportion of training funds to be provided from outside government. Currently targets as high as 50 per cent non-government funds are being discussed, but rarely yet met. It is difficult to compare such targets from country to country, because it depends very much on the tax regime and also the stage of the country's development. For example, developing countries are usually much more dependent on government funds, first to "kick start" the TVE programme in the country and second, enterprises are generally at such an early and fragile stage in their development that government help for training is extremely important.

If a commission for vocational education and training were to be established in a country, it ought to be directly responsible to the minister with TVE in their portfolio. Its membership should be drawn from industry (both employer and union), governments, the education and training industry and the wide community to represent the clients.

Where the commission receives its advice is important. The lobby groups, national industry advisory bodies, state systems, suppliers of

training, community groups and particularly those representing disadvantaged groups all should have the opportunity to present their case. This approach keeps much of the lobbying by interested groups at arms length from the government, which can be a significant help to a minister who is usually pressed by many other national concerns. The role of such a national commission may well include advising on:

- the directions for TVE development, including national policy and priorities;
- the teaching and course profile and changes in the profile of training institutions that are to receive government funding;
- the levels of government grants to TVE institutions both public and private;
- capital developments, including buildings and telecommunications;
- national competency standards, accreditation and registration;
- auditing, both fiscal and performance and exercising sanctions;
- establishing benchmarks and monitoring performance; and
- establishing and maintaining an appropriate national statistical system for TVE.

Each country would need to decide for itself how far it would wish to go with these functions. In addition, the extent to which the commission had control and the extent to which its role was just advisory should be decided by a country based on the stage of development, proportion of funds from government sources and the nature of control mechanisms normally applied.

If this approach is the one occurring at the national level, then individual institutions, whether public or private, or TVE systems should organise themselves in such a way as to be able to respond to the national body. This will require an individual institution to put in place a system establishing its profile, statistical collection and offering of its programs in a manner consistent with the national commission structure if it were to receive public money, have courses accredited by the national body, or be a registered provider.

Practical links

There are other practical ways at the local level to encourage teaching industry links. Part-time teaching by people employed in an industry,

teachers teaching people while they are on the job, and establishing training centres at major enterprises have all been tried with greater or lesser success. There are schemes to give teachers an opportunity to return to industry, and policies which only allow teachers to be hired who have had a minimum of say five years experience in an industry. All have positive influences and these schemes have to be judged on the basis of the benefit received for the cost.

Key Issues

To bring this paper to a close, some of the key issues facing countries as they grapple with future directions for their TVE systems are set down. They are:

- the business of technical and vocational education: how does it fit between schools and universities and how does it relate to the new industries that are emerging. What is its core business, how should it be funded and how can its quality be guaranteed;
- the new relationship between training providers and the industries they serve: as a training market develops and there is a genuine choice by industries for where they want their employees trained, how will this change the way public and private providers operate;
- the impact of technology, the delivery of training in the workplace and the closer integration of training and work: the changes occurring will affect the nature both of work and of training. What changes in policy are needed to allow more rapid responses to training need;
- the industrial implications of the reform of TVE: what are the changes in work practice teachers will be expected to deliver. What policy directions will be needed to allow for this workplace change in the education industry and how can they best be negotiated;
- the growing internationalisation of education and training: will TVE become a global industry, and if so, what safeguards will be required to ensure that the needs of a country for TVE are met;
- the new clients likely to seek training from TVE institutions: how best can the systems respond to their needs; how can the systems be more flexible to meet changing client needs;
- the role of government providers as the number of private and

international providers increases: as the market becomes less regulated and more open what will be the impact on costs, modes of delivery and who should pay;

- the development of TVE as an industry in its own right: what will change about their relationship to other industries and how will TVE operate itself? What kinds of consortia will form and what kind of culture should this new industry develop;

- the organisation and structure of TVE: this applies at both national and institutional level. How are these structures likely to evolve in the period ahead.

CONCLUSION

The vocational education and training industry is developing apace. It is emerging rapidly from being the cinderella sector between schools and universities to becoming a driving force in guaranteeing the quality and competitiveness of enterprises. Nowhere within the whole education industry, and rarely in other broad industry areas is change occurring at the pace that it is in TVE. One of the critical areas of change is the relationship between the suppliers of training and the industries they serve.

As TVE becomes more client centred and subject to genuine competition, the suppliers of training will become much more responsive to the needs of the industries they serve and their employees. The biggest challenge is to encourage more young people into employment with skills relevant to the increasingly complex tasks they will be expected to perform.

A second challenge only lightly touched on in this paper is to develop a programme of lifelong education which will allow older people to return to the workforce with new skills if they find that their industry, through restructuring, causes them to seek new employment. Greater flexibility in employment will become the norm and people will need to be prepared for unpredictable changes.

A third challenge will be to see that the disadvantaged, and those who have been helped by the specific programs directed to their needs do not miss out in the increasingly competitive work environment we are facing. There are difficulties with industry driven training if it does not develop

more than skills, that is, if it does not direct itself to changing attitudes and explaining the nature of work. Also, industries do not necessarily see that providing access to work to those who are less immediately employable is one of their responsibilities. If our societies are to offer some balance and equity to our citizens, then it is critical that those organisations who own work see themselves as making their contribution to providing productive work to a country's citizens, and particularly to the young.

The world of TVE is in a state of flux, as is the world of work. The issues are now coming clearer. Time will tell whether we have the wit to achieve the best solutions to the dilemmas we face. To do so will no doubt mean a happier and more productive world.

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Technical Education and the World of Work: The Brazilian Context

by

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SUMMARY

The global economy is increasingly being driven by technological innovation in order to make individuals, enterprises, and economies more competitive. This innovation refers to the process of acquiring knowledge and transforming it into new or improved products, processes and services that meet the host of market needs. Technological innovation also creates new businesses and jobs which has been proving to be one key factor for growth and wealth in society.

One of the most important links in the innovation chain are government-industry-educational institution partnerships as a means to create and share new knowledge as well as provide both high quality education and skilled professionals in technical areas. In Brazil, however, such a co-operation is limited to a small number of experiences involving few technical centres and schools and few enterprises. The government at all levels also have a limited role as an agent that promotes effective and lasting partnerships in technical fields.

Thus, considering that the country has been exposed to increasing internal and external competition, it becomes extremely relevant to stimulate stronger alliances between enterprises and educational institutions in which the government must have a more active role as another actor in such a partnership. These alliances could provide benefits to enterprises, the community, as well as fulfil the role of educational institutions.

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INTRODUCTION

The world of work is being changed dramatically by the growing process of globalization of the world economy and the rapid technological changes in the area of information and communications that facilitates an increasing exchange of products and services and, by doing so, create a highly competitive international market. These changes are affecting production processes, work organisation, job contents, and the requirement for intelligent work, practical skills, innovation and technology in order to make enterprises become more flexible in this competitive environment. Knowledge, skills and competencies of all men and women have turned out to be one of the crucial factors for personal growth, employability, enterprise's competitiveness, and the economic and social sustainability of all developed and developing societies.

Within this context, the capacity to generate new knowledge and technological innovation through the production of services and products to be shared by the whole society is based in two factors: a) human resources able to both generate and transform this new knowledge and b) science and technology as the base to industrial development. The development of these two factors relies, among other things, on general and technical education, training and lifelong learning[2] with quality. These have not only become more crucial than before (to keep up with the demand for the development of a labour force with new skills), but also need to be considered as integral parts in a continuum that involves individuals, governments, educational institutions, enterprises, organisations and society at large.

One strategy able to strength this continuum focuses on both the market and the technological progress through the development of strategic alliances between governments, educational institutions[3] and firms as a

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[2] Lifelong learning refers, in this paper, to traditional knowledge, the acquistion of new knowledge and skills in formal education as well as learning that takes place in informal ways and on-the-job.

[3] Educational institutions is a term that is going to be used in this paper in

means to both increase the competitive advantage of individuals, enterprises and societies as well as ensure that all parties involved benefit from this relationship.

The combination of rapid technological change and increased international competition, for example, has been placing extreme demands on companies' in-house research capabilities. The need to meet these demands, can create opportunities for industries to look at educational institutions as a means to a) conduct long-term exploratory research, b) provide assistance in areas specifically aimed at improving their own internal research capability and c) provide highly skilled and up-dated graduates in technical areas.

In turn, in order to meet these needs, educational institutions have the possibility to expand their traditional role (as creators of new knowledge and suppliers of high quality professionals) and become active agents of technological innovation, products and services. By doing so, they not only provide benefits to enterprises and the community, but they also create opportunities for both teachers and students to be part of a continuous educational process in which theory and practice become intimately related through work and research experiences derived from demands of enterprises. In addition, these opportunities also enable teachers and students to develop creative and team work skills which have the potential to improve their ability as researchers and entrepreneurs in a global and changing market economy.

THE CURRENT SOCIO-ECONOMIC TRENDS IN BRAZIL

The increasing globalization of production and the liberalization of national and international markets are leading to changes in the economic organisation, labour market structure, production organisation, and work qualification in many Latin America countries. These changes are influencing a shift away from the so-called import-economic model previously adopted in many of these countries[4]. These are experiencing

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reference to technical and vocational centres and schools.

[4] The import-substitution model assumed different characteristics in

the emergence of a new model that can be found in various implementation stages, and which results still are very heterogeneous and uncertain[5].

In Brazil, the import-substitution economic model[6] was based, among other things, on a significant degree of state intervention and had an inward orientation aimed to develop the national industrial complex. In order to do so, strategies were adopted to a) protected the internal market from foreign competition and b) develop an internal consumer market. At the production level, industries combined the use of capital intensive

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countries like Brazil, Argentina, Chile and Mexico. in Brazil, for instance, the state played a stronger role as promoter of economic development than in Argentina and Mexico. The process of internationalisation of the economy was also more extensive than in Argentina - a factor which allowed Brazil to achieve greater economic growth during the 1970s. In addition, while the Argentine government stimulated the expansion of both the export and industrial sector, the Brazilian government focused on the development of the internal consumer good industry and market (Lakomy, 1995).

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At the production level, for instance, studies undertaken in Brazilian firms indicate that the majority still prefer to rely on cheap labour with low educational level as a means to obtain competitive advantage rather than seek for new forms of production based on skilled labour and new technology to improve the quality of their products and service. This approach could be seen as a reflex of the main characteristics of the import-substitution model (Lakomy, 1995).

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The import-substitution model was based on ideas developed by the Economic Commission for Latin America (ECLA). The Commission suggested that the main obstacle for economic growth in countries like Brazil was its reliance on the agricultural export-sector. Thus industrialisation was seen as increasing the productivity per capita, enabling capital accumulation and, simultaneously, raising the socio-economic well-being of the majority of the population. This process was perceived as requiring both a significant degree of state intervention and a significant contribution of foreign technological and financial resources (Lakomy, 1995).

technologies with semi- and unskilled labour. The model allowed a great process of industrialisation and urbanisation that led to the so-called "Brazilian Miracle" in the 1970s. During this period, the GDP grew from 3.7% to 11.3%, and industry achieved an expansion rate of 12.6% which represented 26% of the total GDP - a figure similar to the Japanese (30%) and South Korean (28%) economies (CEPAL/UNIDO, 1992).

However, the economy entered the 1980s with serious problems (such as increasing internal inflation and recession) caused by a world-wide recession and a greater international competition (Lakomy, 1995). In the beginning of the 1990s, the government adopted measures such as privatisation policies, the integration of the economy into regional blocs (like MERCOSUL) and trade reforms that aimed, among other things, to open up the once protected internal market to foreign competition in order to promote economic stability and growth (Longo, 1992). These measures implied a move away from the import-substitution model which is explained by Longo (1991) in the following way:

"Changes made to industrial and trade policy since 1988 were designed to alter the development model that prevailed in the 1980s - a closed, not competitive, inefficient model that helped to undermine the economic and technological dynamism of this decade." (Longo, 1991, pp. 23)

These economic changes raise questions as to whether Brazilian enterprises have the potential to become more competitive and responsive to market changes at all levels. This is an important question considering that these firms, used to be protected from foreign competition, still tend to rely on low labour costs, cheap labour with low educational level[7], and limited technological innovation as a means to obtain some competitive advantage. Changes in this respect rely, on a certain extent, on the development of partnerships with educational institutions in order to provide firms with alternative ways to improve the competitiveness of their products and services in both internal and external markets. Based on both technological innovation and a more flexible and skilled labour force able to explore the full potential of the new technologies, firms can

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[7] Data from SENAI (1988) shows, for instance, that in the Sao Paulo, the most industrialised one, 69% of the labour force had not completed primary education and only 4% had higher education

acquire the potential to move away from a mode of production based on Taylorist practices to more flexible forms of production able to allow quick responses to market changes.

IMPLICATIONS ON TECHNICAL EDUCATION

The current changes on both the world and the Brazilian economy have created a debate involving educational institutions and enterprises. This debate, however, has been polarised by two different positions that have been preventing advances with regard to the development of partnerships that could provide benefits to individuals, enterprises and the society as a whole. In other words, there has been a very low level of co-operation between Brazilian enterprises and educational institutions, and in particular, technical educational centres and schools.

Educational institutions, on the one side, argue that their functions are the development of knowledge and the formation of human resources regardless the production process (understood as the industrial and service sector). Their position is based on the idea that the needs of the latter cannot determine the way in which universities and technical centres and schools should fulfil their functions. In addition to this view, these institutions are not only bureaucratic machines, and by being so, tend to create administrative and financial obstacles to develop partnerships with enterprises, but they also lack a strong institutional apparatus able to develop and maintain a positive co-operation with the productive sector.

The productive sector, on the other side, influenced by a protective economic model, does not seem to be concerned with both the need for a more skilled labour force and the promotion of technological innovation. As a result, firms do not tend to perceive the importance of developing partnerships with educational institutions in order to either receive research assistance in areas that could improve their internal research efforts, nor fulfil these institutions' role in both creating new knowledge and supplying highly trained and well educated graduates in the technical fields. For instance, since 1977, Brazilian expenditure on science and technology represented, on average, 0.6% of the country's GDP - four times less, relatively, to expenditures in industrialised societies like United States or Japan (Ferraz et al, 1992). The technological efforts are also modest considering that it represented 0,48% of GDP while in the United States it was 2,83%, Japan 2,81%,

and Germany 2,66% in 1989 (OECD, 1989)[x].

The Brazilian government, in turn, has been having a limited role in promoting and supporting strong and lasting educational institution-industry partnerships. Although it recognised a) the low participation of enterprises on co-operation programmes with educational institutions, b) the lack of tradition of these institutions with regard to the establishment of partnerships with the productive sector, c) the importance of developing partnerships as a means to speed up the development of the competitive potential of firms, and d) the important role that both can play in order to achieve socio-economic development, it has assumed a laissez faire position by not becoming actively involved in the development process.

The government has reduced its role to put forward two incentive laws which provide financial/fiscal incentives to certain types of firms that develop partnerships with educational institutions in the area of technological research. The Law 8.661/93 only stimulates partnerships between educational institutions and technical and agro-technical industries. In this case, firms use their own money to invest on R&D projects in order to have tax debates. The Law 6248/91 is directed only to firms that work with computer technology. According to this law, firms need to invest 5% of their income on R&D projects. From this amount, 2% has to be invested outside the firms, that is, put on the development of co-operation activities with educational institutions.

Having in mind this context, one can argue that Brazilian enterprises need to become aware of two factors. On the one hand, the technological development associated with a qualified labour force are essential factors for the improvement of their competitive capacity. On the other hand, a

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[x] Although these indicators show that the country is lagging behind the more developed ones, there are industrial firms with a clear concern about technological issues and quality. However, these are islands in a sea of low innovative capabilities and concern with human resources. These are concentrated in a small number of large, domestically owned firms, located in a few industrial sectors in which the largest firms were responsible for more than a half of the total expenditures on technology in 1982 (Ferraz, 1992).

strong and lasting partnership with educational institutions has the potential to enable firms to achieve the goal above. Secondly, educational institutions need to move away from the "ivory tower" in which they find themselves, and understand that the production of knowledge and the professional education of individuals cannot be separated any more from the social, political and economic changes affecting the society. Finally, a tradition of co-operation between government, educational institutions and enterprises need to be nurtured and emphasized in order to tackle the current pitfalls of both technical education and the development of new production processes as a means to improve the Brazilian current socio-economic conditions.

A CASE STUDY: CEFET-PR

As argued before, there is a very low level of co-operation between enterprises and educational institutions. The Federal Centre of Technological Education at Paraná[9] (CEFET-PR), however, has developed the most successful partnership with the industrial sector in Brazil. This partnership was developed based on a working methodology which embodies the following ideas:

- Considering the limited participation of enterprises on both research and assistance co-operation projects, the educational institution needs to develop strategies that could open up space for the development of partnerships. It is, therefore, the duty of the institution to begin the approximation process with the world of work as a means to a) provide benefits for the community and b) improve the quality of the education provided.

- All actors involved (firms, teachers/researchers and students) in a process of partnerships need to be seen as being part of a continuous educational process which provides benefits for all.

- The development of co-operation projects depends on two key factors. On the one hand, an institutional policy needs to be developed and supported by the whole educational institution

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[9] See appendix 3 for more information about CEFET-PR

(directors, teachers/researchers, students) in order to establish consistent activities involving the community. In particular, the general director needs to become the major interaction agent or link with the industrial sector. On the other hand, the institution has to develop a special infrastructure responsible for providing the guidelines, support and internal/external marketing strategies for the development of these activities.

Based on these principles, CEFET-PR created in 1993 the Department of Industrial Affairs which was responsible for:

- Developing a data base system which embodies information about all teachers/researchers who can participate in co-operation projects according to various areas. These are individuals from both the institution itself and other organisations.

- Creating the necessary infrastructure for the development of short, medium and long term researches (like labs and equipment).

- Developing an internal marketing strategies to sensitize individuals in the institution to the benefits of taking part in co-operation projects with industries. For example, the distribution of internal journals with summaries of the researches undertaken in the institution, the organisation of seminars involving all departments, the diffusion of a "partnership culture" as a gain-gain process, the elaboration and distribution of procedure manuals explaining the benefits derived from co-operation projects, and special informative bulletins for students so that these could feel stimulate to participate in such projects.

- Finally, having completed all the stages mentioned above, the department put into practice an external marketing strategy by which representatives of the department established a direct contact with directors of enterprises in order to explain the institutional potential to develop firm-relevant research/assistance.

One example of a programme that led to the development of medium and long term co-operation projects was the so called Dial CEFET. The programme, which is directed towards all types of firms, has a direct line through which trained individuals provide assistance, in 48 hours, to

firms that seek technological assistance of different types. The attendants usually consult professional who work in the centre. However, when a professional is unable to provide a solution or the centre has no specialised individual in the area, the attendant search for a specialist in other institutions. The important factors is to provide the assistance required in a very short period of time.

Dial CEFET received 600 consultations between 1993/96. The majority can be characterised as having low technological level although the solution normally proved to be important for the quality and competitive potential of medium and small firms. The programme also generated 80 medium and long-term co-operation research projects which make use of the Law 6.248/91.

FUTURE STRATEGIES

The development of strategies aimed at improving the relationship between Brazilian educational institutions and enterprises includes a more active role or involvement of the government at all levels in the co-operation projects themselves. This involvement not only refers to the provision of other forms of incentives to firms, but also financial support for educational institutions so that these can have conditions to create the necessary research infrastructure. Thus, financial support is one mechanism that have the potential to stimulate educational institutions to develop the so-called partnership culture among teachers/researchers and students who could have the necessary conditions to work with the demands of the world of work.

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Appendix 1: Key Facts about Brazil

Official Title: Federal Republic of Brazil

Capital: Brasilia

Area: 8.547.403.5 Km*

Geography and Climate: It is located in South America. The climate ranges from tropical in the North, Northeast, Centre and Centreast to temperate in the South and Southeast.

Population: 148.216.677
Female: 75.725.9396
Male: 72.491.281

Official Language: Portuguese

Political System: A Presidential Republic which president is Fernando Henrique Cardoso.

Administrative System: Brazil is a Federation made up by 26 States and 1 Federal District where the capital is located. The States are divided into 5.024 Municipalities.

General Educational System: Three-tired structure with a primary, secondary and tertiary level. There are both a public educational sector, which is tuition free, and a private sector in all levels.

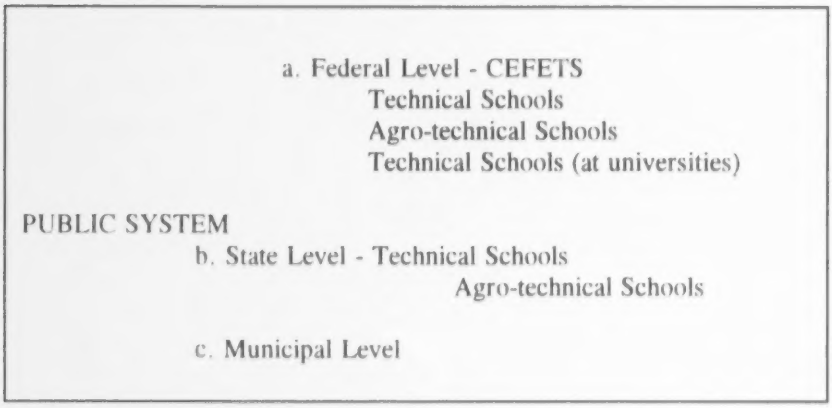
Appendix 2: The Brazilian TE System

The National Educational System is divided into three parts: general education, technical education, and vocational education. The Technical Educational System is separated from both the general educational and the vocational system. It is made up by two sub-systems: the public and the private one.

The Public Technical Educational System comprises schools and centres located at federal, state and municipal levels. These, which are tuition free, offer secondary and tertiary courses in technical, commercial and agricultural fields. They are subordinated to the Ministry of Education,

but have disciplinary, financial, administrative, patrimonial, and didactic autonomy. There are, at federal level, 5 Federal Centres of Technological Education (CEFET), 22 Technical Schools located in universities, 27 Technical Schools and 36 Agro-technical Schools. At state level, there are approximately 115 technical schools in the South of Brazil. The municipal system, however, is not functioning. The whole public system has 100 thousand students at secondary level. Only 45% of these follow a technical career while the rest go to university where they choose different fields of study.

Diagram 1: **The Structure of the Brazilian Public System of Technical Education**



Purposes of the centres and schools[2]:

a) They provide secondary (middle level technicians and teachers) and tertiary (including master and doctorate degrees) courses;
b) They offer short and long term training courses aimed to prepare teachers for technical areas;
c) They provide longlife education by offering short courses for professionals who aim to update their skills and knowledge in technical areas[3];
d) They undertake research in various areas and, by doing so, provide services to the community.

The Private System of Technical Education is also made up by two sub-systems. One comprises approximately 4 community schools maintained by industries. The other, which has around 30 technical schools, embodies SENAI (National Service of Industrial Apprenticeship) - it has 1.200.000 students - and SENAC (National Service of Commercial Apprenticeship) - it has 1.200.000 students. The latter are run by the National Federation of Industry and the National Federation of Commerce respectively.

Diagram 2: The Private System of Technical Education

PRIVATE SYSTEM	a. Community Schools
	b. SENAI - SENAC

[1]) The Ministry of Education has no aggregated data about the number of teachers and students by subject.

[2]) The centres and schools have the autonomy to function in different ways. For instance, the Federal Centre of Technological Education at Paraná has developed a network in the Paraná state by creating 5 decentralised units that aim to meet the specific demands of the rural regions in which they are located. This centre (including the units) has 11.715 secondary level students, 2.295 tertiary level students, 201 postgraduate students, 1.028 teachers and 696 employees in various areas.

[3]) The Centres have autonomy to offer different types courses at all levels.

Appendix 3: Key Notes about CEFET-PR

Brazil has 5 Federal Centres of Technological Education (CEFETs) located in the following states: Paraná (South), Rio de Janeiro (Southeast), Minas Gerais (Centre), Bahia (Northeast) and Maranhao (North). They comprise around 33.000 students at secondary level.

Historical Background

The Centro Federal de Educa ao Tecnologica do Paraná (CEFET-PR) is an autarchy related to the Ministry of Education and Sport, with administrative, patrimonial, financial, didactic and disciplinary autonomy.

It offers technological education at secondary, tertiary and post-graduate levels, provides training for teachers specialised in technical subjects, and short-courses for professionals from the productive sector and the community. It also undertakes research projects that have the potential to bring about benefits to the community.

It was created in 1910 in order to provide education for both poor students and abandoned teenagers. In 1946, it became a centre for the training of teachers and, in 1978, it was named CEFET-PR. In 1991, it started an expansion project that involved the creation of other 4 centres in the countryside in order to meet the educational demands of the rural population in the West, Southeast, North, Centre and Northeast of Paraná.

Table 1: **CEFET-PR: the number of teachers, students and administrative staff**

CEFET-PR	2nd Degree Stud.	3rd Degree Stud.	Post-Graduate Stud.	Teachers	Adm. Staff
Curitiba	6274	1288	201	595	345
Medianeira	1083	30	-	84	93
Pato Branco	1323	977	-	146	67
Ponta Grossa	1739	-	-	96	74
Cornelio Procopio	943	-	-	78	76
Campo Mourao	353	-	-	29	41
TOTAL	11715	2295	201	1028	696

Courses Offered[1]

Technical courses - Secondary Level

Industrial Design
Electronics
Aliments
Electrotechnics
Construction
Mechanics
Telecommunications

Graduation Courses - Tertiary Level

Electrical Engineering
Mechanical Engineering
Production Engineering
Agronomy
Administration

Data Processing
Formation of teachers for specialised disciplines at secondary and tertiary degrees

Post-graduation

Specialisation courses:	Safety Engineering Applied Mathematics Informatics Industrial Informatics Management of Maintenance Tele-informatics Teaching Methodology Industrial Automation
Master Degree:	Industrial Informatics and Electrical Engineering - Biomedical and Telematics Engineering Technology - Technological Education and Technological Innovation

[1]) To initiate both secondary and tertiary course the students must pass an exam. Secondary degree candidates also need to finish the 8 years of primary school.

Current Trends of TVET in Germany

by

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SUMMARY

Enterprises all over the world suffer from the increasing pressure of competition and globalization. At least in the last decade, the comfortable position of Germany in the world market has been threatened continuously. International confidence in German quality proofs to be not sufficient any more, if it is not accompanied by reasonable prices. But because of our strong currency and high labour costs, Geman enterprises often find it difficult to compete with the lower production costs of other countries.

The market pressure leads entrepreneurs to modernize, not only with regard to technology but also referring to labour organization and production designs. Re-engineering and lean production are the topics of the very fundamental changes which take place in German firms now. The new working conditions demand for new skills, too, being the capacity to keep life long learning the most important one. Vocational Education and Training is upvalued by these trends, because qualified work is appraised as the prerequisite for new production systems. At the same time TVET is down valued especially under individual aspects, because nowadays completion of training does not guarantee a secure and life-long position in the labour world at all.

But the national economy in Germany depends on a large scale from its capacity to provide the production systems with well qualified labour forces. Labour is expensive in Germany and, as a consequence, has to be highly productive. The dual system of TVET has proved to be able to react to the problems of a rapidly changing world. We regard the solid institutional structure, the strong social consensus about the importance

of vocational qualification, the willingness and the ability of the social partners to contribute to a general consensus and the highly qualified staff dealing with education and training within vocational schools and private companies as resources which will help to deal with the actual challenges.

CURRENT TRENDS IN SOCIO-ECONOMIC DEVELOPMENT

Since the seventies, technological progress (e.g. information networks, transport systems) and new geopolitical fusions have made the world look smaller. International economies become more global and competitive. Capital, management, markets, labour, information, and technology ignore national boundaries. Only economy-priced, high-quality products are able to compete successfully. Enterprises all over the world are forced to calculate their costs restrictedly. The organization of production changes from mass standardized production to flexible customized production able to react to the specialized and varied consumption taste. Product innovation goes on with increasing velocity. Flexibility and innovation capacity become requisites for the very survival of enterprises.

Like in any other country of the world we observe these trends with fascination and fear in Germany, too. Our former strong position in the competitive world economy has to be defended. One of our most troubling problems are the high unemployment rates. The states of the former German Democratic Republic are affected stronger than the western parts, but even there the statistics reach new records every year. We have more than four millions of unemployed persons recording to official statistics now - that means an unemployment rate of 10,2%. Shortage of work is stressed as a very central political issue.

Of course unemployment is a very complex phenomena and it´s reasons cannot be discussed fully at this opportunity. Regarding to our topic – socioeconomic development and its impact on manpower qualification – only three main issues shall be mentioned: First, one reason for unemployment in Germany consists in the consequences of technical advancement itself. Especially jobs of low qualification level have been substituted by very sophisticated production systems. The substitution of manpower by machines looses importance within the production area now, given the fact that the main part of dismissals caused by substitution processes took place in the seventies and eighties. In spite of this, I regard the issue as a central point because the high standard of

technology in german production systems confronts the remaining workers with higher expectancies of qualification and shapes different manpower utilization schemes in Germany.

Second, high wages and high standards of social security in Germany motivated many entrepreneurs to evacuate production to other countries with lower manpower costs. This is true especially for manpower intensive production. Whereas profits made by German enterprises raise spectacular extent, the portion of gains stemming from production centres in Germany is falling.

At last, globalization and the even stronger competition in the last years forced German enterprises to re-organize their production systems. Lean-production, out-sourcing and down-sizing are key words that highlight economical trends in Germany and are to be associated with the high number of discharged manpower, too.

As a consequence from these trends, and regarding the historical and present background of the German production site, qualification is seen as a crucial factor for defending our position in the world market. If Germany as one of the leading industry nations is to survive and wants to preserve its high standards of social security, it has to strengthen a profile of highly qualified and therefore well paid labour force. Entrepreneurs will find cheap labour in many countries all over the world. The German society is hoping that the qualification and competence of our workers compensate this competitive disadvantage sufficiently to conserve the economic standards we reached until now. There exists a strong certainty about the importance of solid education, broad training and continuous education for work. At the same time, enterprises exploit the advantages, the existence of a large stock of qualified labour force offers.

The mutual interaction between qualification, labour market and labour organization permits new forms of manpower utilization in modern firms. Division of labour reached the limits. It is obvious now that dividing work even smaller and smaller will not contribute to exhaust any more productivity. On the contrary, enterprises begin to believe in motivating people by re-integrating tasks such as planning, control and maintenance into production. Taylorized job designs are replaced by comprehensive production-systems based on highly qualified work, complex job assignments and teamwork structures. Modern technologies provide the

possibility to adapt production schemes to changing demands, and competent personnel is needed to handle such flexible production technology.

In technologically advanced production systems, workers have to solve increasingly complex problems. Pre-defined solutions do not work anymore. To deal with unstructured situations like this, workers need a solid base of general skills. Specialized knowledge restricted to only one workplace are not sufficient any more. Workers are supposed to understand not only their own job, but the whole production process, if they have to deal with planification, maintainment or innovation tasks. They need to communicate more precisely about arising problems. Capacity and willingness to be flexible become decisive skill.

COOPERATION BETWEEN TVET AND THE WORLD OF WORK

The recent discussion about qualification needs in a highly advanced technological society reveals a fundamental contradiction: on the one hand there is a strong demand for flexibility, mobility and a closer linkage between education and training. Technical education is supposed to meet economies' growing demand for adaptable workers who can readily acquire new skills. Only broadly educated workers can deal efficiently with a rapidly changing environment (see World Bank 1995: 25). So TVET is challenged to provide broad technological knowledge, basic communication skills and the ability for self-organized learning. The call for broader skills emerges from both the challenges of flexibility in modern production and the insecurities of labour market. Specialized skills get obsolete quickly; flexible production needs workers that dispose of general knowledge and process competencies; teamwork production demands for communication between different occupations and on different levels.

At the same time, governments and school administrations are expected to link TVET as far as possible to enterprises, to transfer a part of the responsibilities to private enterprises, to make available private support and orientate training by demand. To establish labor market linkages is mentioned as an important goal for educational policies in the new World Bank paper (see World Bank 1995: 24). Job-related training is supposed to be more effective with regard to the learning process and the success of TVET-graduates on the labour market.

One TVET-model which is especially well known for combining the generation of general qualifications with that of specialized labour-skills, is the german dual system of TVET. Responsibility for TVET is shared between the state and the industry. To foreigners, our historically grown TVET-structures often seem really complicated and little transparent. The system is a complex network of legal, administrative and operational cooperation not only between schools and firms, but between national and regional public institutions and employers´ organizations as well as trade unions.

With regard to the formal structure of the dual system I will limit the description to a few basic facts: Compulsory schooling in Germany is not restricted to general education. Students who graduate after 10 years of schooling achieving a certificate or not, have to attend some programme leading to an officially recognized professional qualification. The most common type of programme is part of the dual system and called Berufsschule. This part-time school caters to apprentices who, in addition to the practical training gained within their firms, receive both theoretical instruction in their trade and also some additional general education (e.g. in German and civic education). Instruction takes place regularly for one or two days per week or, alternatively, for blocks of several weeks. The type and objectives of vocational training courses are determined by the knowledge and skills specified in the profile of the trainee occupation; the time schedule and the subject matter are laid down in the overall training plan. The period of training should not exceed three and a half year nor should it be shorter than two years.

But the duality of our system is not exhausted describing the two learning-sites (or three if we take interplant training into account). Another crucial element organized in a dual form consists in the certification system. I mentioned that vocational education is delivered by state-run schools, but the final certificate is awarded by the local Chamber of Trades, Industry or Commerce.

The drawing up of training regulations and coordination with the skeleton curricula of vocational schools consists in a rather complicated procedure. Representatives from the Federal ministry of Education, Science and Technology, from the employers organization and trade unions, the Federal Institute for Vocational Training and the Standing Conference of state ministers of Education and Cultural Affairs discuss, develop and decide about modification of training regulations.

The procedures has been criticized for being too complicated and too time-consuming under the aspect of innovations. A complex web of institutional structures like the German dual system of vocational education and training, generally lacks of flexible adjustment, just-in-time , Cooperation between the two learning sites, schools and enterprises, sometimes fails. On the other hand, it has to be resumed that in dual TVET-models enterprises have a vital interest in keeping training contents up to date and they do dispose of the institutional instruments to care for continuous innovation. Adapting curricula to new labour situations is a difficult process in Germany, but generally it works.

Since 1969 vocational education within the dual system is regulated by a special legislation called Vocational Training Act (Berufsbildungsgesetz). The Act regulates vocational training in so far as it is not conducted in vocational training schools, which are subject to the laws of the individual states (Länder) and it comprises initial training, further training and retraining.

Even financing of vocational training is organized in a dual way since it stems from public funding as well as from private industry. Within the dual system, schools are run and paid by the state, but training within the firm is financed by enterprises. Apprentices receive wages which are also financed by their firms.

In Germany approximately 70% of an age group receive vocational education within the dual system. It may be difficult for other training systems to reach such a high rate of an age-group for job-related training and education. Nonetheless in the difficult economic situation we experience nowadays, the attainment capacity of the dual system is declining. Since enterprises care for expenditures more cautiously, they plan and offer less training. Especially in the eastern German states we find an alarming scarceness for training vacancies in enterprises.

We notice more symptoms of crisis within the German debate about the future of the dual system, too (see Lipsmeier 1994; 1996): traditionally vocational education in Germany leads into a well defined working hierarchy with a broad base of semi-qualified work, a relatively small level of technicians and masters (Meister) (as important career perspectives for the graduates of the dual system) and a very small group of academically trained managers. But this classical concept is erosing now. Responsibilities and competencies are redistributed, changing the

former positions and perspectives of those who leave the dual system substantially. In addition, contents of work changed, too. The former handicraft way of production has become more abstract and the importance of production itself is declining to the credit of a growing service sector. This trend leads many students and graduates to look for more promising careers than those which offers a traditional apprenticeship in the trade sector. In consequence small and medium enterprises deplore the low educational standards of young people searching for training and many training places are not occupied in this sector.

Available certificates have a relatively well defined value on the labour market because they are provided by an interplant or governmental unity. Training is supposed to be pragmatic and job-related since it is organized in and by enterprises. This appraisal not only refers to cognitive knowledge and technical abilities. It is interesting to know that even for non or semi-qualified work, enterprises prefer to engage graduates from the dual system. Often these workers will come from totally different occupations, bakers become automobile-constructors, hair dressers become retailers. Besides the technical knowledge, entrepreneurs obviously honor the educational and socializing effects of the dual system.

GOVERNMENT INITIATIVE AND FUTURE STRATEGIES

The recent discussion in Germany with regard to new challenges of TVET we can summarize under two topics: Vocational Training is forced to prove more flexibility, and at the same time we have to emphasize the development of key qualifications such as methodological, social and individual competencies.

Flexibility

The falling half-life of knowledge and the rapid change of production systems demand for greater flexibility of the labour force. Knowledge has to become both: broader and deeper. Broad qualification helps workers to orientate themselves in an entire production process and within a larger occupational field. For those who dispose of broad knowledge, it will be easier to change working tasks or working places and to participate in integrative or even innovative work. At the same time, enterprises need

specialized labour forces, able to understand the very specific production processes.

Since the last decade, educational reformers in Germany try to integrate these two directions of learning in a re-organized training scheme: apprentices receive broad information about one occupational field first and continue opting for specializations in the further ongoing of their studies. Occupations and training requirements for industrial metal working and electrical engineering were completely reorganized, with manual skills being reduced in importance and diagnostic, repair, and programming skills becoming more important. The reforms reduced the number of specializations; curricula for the part-time vocational schools and the training regulations for the firms were summarized and structured in a different way. A new basic level of training was introduced where learners receive information about general knowledge in occupational categories. Only after terminating this basic level, the theoretical part of training is subdivided in different occupations. This first general level makes further mobility between substituable jobs easier and helps to understand problems within a broader occupational field.

The benefits of more structured and transparent occupational categories and a reduced number of training programmes are broadly recognized. Summarizing it can be concluded that organization of TVET in occupational fields seems to be a world-wide trend not only in dual training systems, but in many school-based training systems as well.

Modular training is a similar way to enhance flexibility and mobility by structuring TVET-offers. In Germany, because of our specific labour-market structures and the legal base of vocational training, it seems rather difficult to introduce modular training forms which go further than the re-organized apprenticeships mentioned above. But in other countries within the European Community the implementation of modular training is strongly discussed and the politically responsible actors in Germany are forced to re-examine the institutionalized form of three-years apprenticeships.

Modular training approaches also support concepts of life-long learning because it can be a link between TVET and further training. Life-long learning is getting increasingly important because it is supposed to do both, to repair eventual deficits of TVET and to adapt knowledge and skills to the future technical evolution.

Key Qualifications

If personal and social skills shall be trained in TVET, traditional training methods have to be appraised as questionable. Trainees will learn to work in a self-organized and flexible way only if the learning process itself allows such self-responsibility and competency. New learning methods aim at the generation and the coaching of these skills.

Two main tendencies shaped the re-orientation of vocational learning since the seventies in Germany (see Lipsmeier 1994a: 34): first, the increase of integrative training and learning methods (integration of theory and practice, integration of general and vocational education) and second, the opening of learning processes to self-organized learning.

Methods like self-organized learning or learning in projects were developed in enterprises, but they also prove to be successful in vocational education. Since the acquisition of "aptitudes and mental attitude which enlarge the capacity of judgement, motivation and competency to react within occupational and extra-occupational areas" (general preamble to the curricular framework of the conference of regional ministries of education) has become part of the curricular framework for vocational schools, integrative methods are used more frequently in vocational educational lessons.

Proceeding on this logic, not only technical knowledge has to be tough to students, but they should be enabled to act with responsibility by transmitting also ecological, economical, political, social and ethical issues. By doing this, TVET may transmit a view of the world as a social and ecological network.

New methodological approaches also change the relationship between students and teachers. Teachers and trainers do not have to perform lessons to a listening audience anymore, they should accompany and coach a learning process that is planned and executed by the pupils. A new culture of self-organized learning and self-training is coming up.

Resuming, I would like to emphasize our view, that the German dual system is going to survive even if it will not be able to attain 70% percent of an age group like it did in the last years. But a solid institutional structure, a strong social consensus about the importance of vocational qualification, the willingness and the ability of the social

partners to contribute to a general consensus, provide the necessary resources for an efficient and innovative system of vocational education and training in Germany.

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APPENDICES

Diagramme of the Structure of the German TVET System

General Statistics on TVET

Apprentices, Students, School-leavers, Completed Apprenticeships, Graduates, Staff

No	Category	In	1960	1965	1970	1975
		Territory A				
33	Apprentices	'000	1285.9	1331.9	1268.7	1328.9
	of which					
34	foreigners	'000	*	*	*	*
35	new training contracts	'000	*	*	*	*
36	Students at higher education institutions of which	'000	281.1	384.4	510.5	840.8
37	foreign students	'000	21.8	26.8	28.4	48.7
38	first year students	'000	79.4	85.7	125.7	166.6
39	of which foreigners	'000	5.2	5.4	5.9	10.7
40	School leavers	'000	*	*	780.7	954.6
41	from secondary general schools	'000	408.6	503.2	489.1	461.6
42	with secondary general school certificate	'000	*	422.8	348.8	347.1
43	without secondary general school certificate	'000	*	134.0	140.3	114.6
44	with intermediate school certificate	'000	*	*	200.1	318.0
45	with university entrance qualification	'000	56.7	50.5	91.5	175.0
46	Apprentices who passed qualifying examinations	'000	*	*	*	460.7
47	Students who passed qualifying examinations	'000	42.6	59.9	77.1	107.4
48	Full time staff employed in the public sector	'000	1802.9	2067.6	2272.9	2612.3
49	at Federal level	'000	211.4	286.8	305.1	322.0
50	at Land level	'000	949.6	1070.2	1209.9	1440.2
51	at Local Government level	'000	641.9	710.6	757.9	850.1
52	Teachers at all schools	'000	263.5	301.9	389.2	495.1
53	at general education schools	'000	224.1	257.7	338.7	431.0
54	pupils per teacher	number	30.7	28.3	26.7	23.3
55	at vocational schools	'000	39.4	44.2	50.5	64.1
56	pupils per teacher	number	42.6	47.4	39.6	31.8
57	Teachers at higher education institutions	'000	*	*	*	76.2
58	at universities	'000	*	*	*	68.0
59	students per teacher	number	*	*	*	10
60	at Fachhochschulen	'000	*	*	*	8.1
61	students per teacher	number	*	*	*	18
62	Other higher education staff	'000	*	*	*	140.1
63	Part time staff employed in the public sector	'000	126.8	205.4	291.7	409.9
64	at Federal level	'000	2.7	4.7	7.0	11.2
65	at Land level	'000	51.2	82.1	124.4	181.6
66	at Local Government level	'000	71.9	118.4	162.3	214.8

0 General Statistics

Apprentices, Students, School-leavers, Completed Apprenticeships, Graduates, Staff

1980	1985	1987	1988	1989	1990	1991	No
						Territory A	
1715.6	1831.3	1738.7	1658.0	1552.5	1478.9	1430.3	33
*	51.4	63.6	73.2	83.6	98.2	108.8	34
670.9	709.2	659.1	610.3	567.4	538.2	532.0	35
1044.2	1338.0	1410.8	1470.7	1509.0	1585.2	1647.0	36
57.9	74.3	81.0	89.8	91.9	99.3	108.1	37
195.0	207.7	229.7	246.2	252.6	278.2	271.2	38
11.6	14.6	16.3	18.8	21.0	23.2	26.1	39
1144.7	1110.2	975.7	936.3	849.6	812.2	792.2	40
560.8	391.6	323.6	286.9	266.0	253.5	249.4	41
391.4	319.9	264.5	231.1	211.9	199.9	195.5	42
109.4	71.7	59.0	55.8	54.1	53.6	53.9	43
422.2	419.7	361.5	340.5	301.5	283.9	275.1	44
221.7	298.9	290.6	291.5	280.1	274.7	267.7	45
567.3	612.5	680.1	643.1	601.6	531.6	498.3	46
112.5	132.6	139.4	142.5	145.7	148.2	*	47
2804.5	2837.0	2857.4	2842.1	2818.6	2848.3	2850.6	48
316.2	312.8	313.1	312.3	310.8	310.1	305.3	49
1567.9	1571.7	1548.3	1538.1	1520.5	1531.4	1535.9	50
920.4	952.4	996.0	991.8	987.2	1002.0	1012.6	51
557.3	546.6	536.4	532.4	539.5	541.7	562.7 1)	52
476.1	457.1	446.7	442.6	450.5	457.7	473.1 1)	53
18.5	15.7	15.0	15.0	15.0	15.0	15.1 1)	54
79.2	89.5	89.7	89.8	89.9	83.9	89.6 1)	55
32.0	29.6	27.9	26.7	25.2	25.8	23.9 1)	56
85.2	92.9	98.8	102.1	*	108.6	*	57
76.0	82.6	88.3	91.4	*	97.6	*	58
11	11	12	12	*	12	*	59
9.2	10.3	10.5	10.6	*	11.0	*	60
22	23	31	32	*	34	*	61
160.6	186.2	193.9	196.1	*	205.2	*	62
505.3	629.1	660.1	681.7	701.1	721.9	743.8	63
13.5	17.5	19.4	20.2	21.1	22.1	22.4	64
255.5	343.1	361.7	376.6	391.0	399.1	404.9	65
236.2	268.6	279.1	284.9	289.1	302.7	316.4	66

1) Including Berlin East

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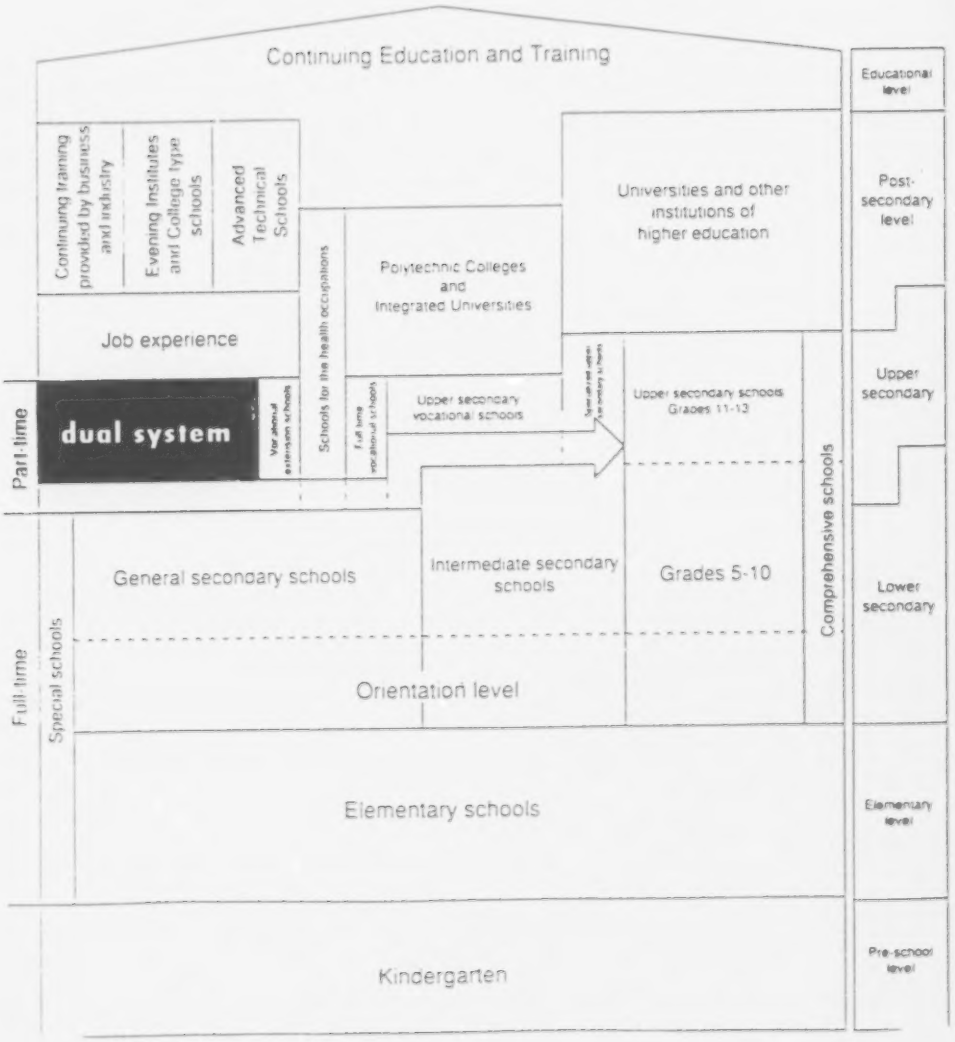
Education in Germany

The basic structure of the German education system



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Linkage between Technical and Vocational Education and the World of Work in Indonesia

by

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SUMMARY

The development of human resources is given high priority in the preparation of Indonesia to face ASEAN free trade in 2003 and APEC free trade in 2020. Technical and vocational schools, as a sub-system in Secondary Education, play an important role in the preparation of skilled manpower. Therefore improvement of quality of the technical and vocational schools is essential.

The "Link and Match" policy between education and the world of work has been introduced by the Minister of Education and Culture since 1993. The policy is translated into Pendidikan Sistem Ganda (PSG) for technical and vocational schools. PSG is a form of dual system of education and training conducted at schools and the world of work. The objectives of PSG are: to produce qualified skilled workers, to strengthen linkages between schools and the world of work, to increase efficiency of education and training, and to acknowledge work experience as part of the education process.

The teaching learning process at school and in the world of work is geared towards achievement of professional competencies and appropriate work ethics. The experience to work in real work conditions is condusive for the development of skills and work ethics.

The PSG belongs to and is under the responsibility of the technical and vocational schools and the schools's partner. The education and training programmes are developed jointly by the school and industry in regard to:

- Professional or competency standard of graduates

- Education and training standard
- Standard of evaluation system and certification

A National Council for Vocational Education or Majelis Pendidikan Kejuruan Nasional (MPKN) is established at national level to support and coordinate the implementation of PSG. Simultanously at provincial level Provincial Councils for Vocational Education or Majelis Pendidikan Kejuruan Propinsi (MPKP) are established. School Councils or Majelis Sekolah (MS) are set up at each SMK to help the school in finding partners for PSG and help manage the implementation of PSG.

INTRODUCTION

Indonesia, with a population of 200 million, consists of 13,667 islands and is the largest archipelago in the world. The land area is about 1.9 million sq km, while the Indonesian sea area is four times greater - about 7.9 million sq km.

With the huge number of people, human resources development play an important role in the national economic development. Therefore, the development of education is given the highest priority. This commitment is in accordance with the 1945 State Constitution which stipulates in Article 31 that (1) every citizen has the right to obtain an education, and (2) the government provides one national education system by law. The law of National Education System was legislated in 1989 and provides direction for the government in education development efforts and guidance in the implementation of the national education system.

The national education system has its roots in the Indonesian culture. The system, which is based on Pancasila, the 1945 State Constitution, and the Law number 2/1989 on National Education System, aims to generate abilities and to increase the standard of living and dignity of the Indonesian people in order to achieve the national development objectives. The goal of the national education system is to elevate the intellectual life of the nation and to develop the Indonesian people to become devoted to God Almighty and to have good character, to have good knowledge and skills, to be in good physical and spiritual health, to have a strong personality and to be independent, and to have responsibility to the nation and their fellow countrymen.

Technical and Vocational Education, which is part of Secondary Education, is developed based on the goals of the national education system. To enter a technical or vocational school the students must have finished 9 years basic education. Basic education is provided at the elementary school (6 years) and junior secondary school (3 years). Basic education has become compulsary since 1994 for all school-age children. Appendix 1 shows the structure of education in Indonesia and its relation to the employment structure.

At present there are 726 public technical and vocational schools all over Indonesia and about 3.000 private schools.

There are six clusters with 104 study programmes which were developed based on needs of the world of work. In 1994 the curriculum was renewed and updated using a competency based approach. Inputs from industry representatives were sought to develop profiles of skills for each study programme.

IMPACT OF SOCIO-ECONOMIC DEVELOPMENT ON TVE

The national development is divided into long term development plans (25 years) and five year development plans. The first five year development plan (Pelita I) started in 1969. Since then, the economy has been growing rapidly. The policy in economic development is industrialization based on agriculture. Manufacturing industries are given priority for investment, while at the same time agricultural expansion and intensification is enhanced. The development of manufacturing plants in the cities and industrial parks has caused urbanization. Ownership of agricultural land in Java is very limited, so that farmers cannot survive. Therefore people in the villages are eager to migrate and work at the plants to get a better living.

The villagers working at the manufacture plants do not have the needed skills and have to be trained at a very basic level. High school graduates, both general or technical and vocational, also do not have the appropriate skills and need to be trained and re-trained. Along with the industrial and agricultural development the service sector is also growing. A high percentage of technical and vocational school graduates also enter the world of work in the service sector, eg in sales, administration, hotel and tourism.

Up to 1984 technical and vocational schools were implementing school based programmed which resulted in graduates not having the appropriate skills for the changing world of work. The curriculum was developed by senior teachers and experts from higher education. Starting in 1985, the technical and vocational schools implemented Curriculum 1984. For content of the curriculum, input from the world of work was sought and was integrated into the curriculum. In spite of that, employers were still dissatisfied with the quality of graduates. Revision of curriculum using the competency based approach resulted in Curriculum 1994.

Although Indonesia has been recognized as one of the newly industrializing economics in South East Asia, trade between the South East Asia region and the rest of the world is only about 5 percent of the total world trade. To expand trade and to continue and sustain the economic success the Minister of Education and Culture mentioned that great emphasis should be placed on the promotion of science and technology. That includes improving the quality of technical and vocational education.

Improving the quality of technical and vocational education cannot be done by schools themselves. Therefore the Minister of Education and Culture introduced the concept of " Link and Match " between education and the world of work. The objective is to increase the relevance of the acquired skills of graduates to the needs of the world of work which is a crucial factor in the contribution of graduates to industrial and economic development.

POLICY IN TECHNICAL AND VOCATIONAL EDUCATION

Four themes of education development were established in 1969 along with the launching of the first long term development plan (Pembangunan Jangka Panjang I). These four themes are:

1. Expansion and equalization of educational opportunities;
2. Improvement of education quality;
3. Improvement of education relevancy to development needs; and
4. Efficiency in educational management.

Since then, all efforts and activities in education have been guided by these four themes towards reaching the objectives and improving what

has already been attained.

In technical and vocational education, the expansion of educational opportunities is being done through building new schools according to the needs of the community and upgrading the existing schools to be able to raise student intake. Investment in technical and vocational schools is very high and loans have had to be made from bilateral or multilateral funding agencies.

Improvement of the quality of technical and vocational education is achieved through curriculum development, upgrading of educational facilities, and upgrading of the pedagogical and technical skills of teachers.

Improvement of educational relevancy to the development needs of the nation is achieved through industrial linkages. Industrial linkages have become more important with the rapid development of science and technology. In 1993 the Minister of Education and Culture encouraged closer linkages between education and the world of work through the "Link and Match" policy. Implementation of this policy is known as Pendidikan Sistem Ganda (PSG) which is a dual system of education carried out in school and industry. This policy is in line with the state policy guidelines of 1993 where is stated that the quality of education needs to be adjusted to science and technology advancement and the demand of development progress. Cooperation between the world of education and the world of work in the framework of education and training should also be continously intensified to meet the needs for sufficient skilled manpower for development in order to match the national manpower planning.

To organize all activities including the support of many donors, the Minister of Education and Culture has introduced a long term programme for TVET in Indonesia called PENTING, short for Programme in Education and Training to support Industrial Growth. Basic premises for the programme are: (1) improvement of vocational education and training will take place as a function of the absorptive capacity of Indonesians to actually implement/execute change, and (2) improvement of vocational education in Indonesia must take into account institutional considerations and constraints, political consideration, the current status quo, geographic realities, and sociatal considerations and realities. The PENTING programme consists of several parts: research and analysis, institutional

strengthening, procedural development, manpower development and promotional development. This programme will be used as a guide in developing strategies and activities to improving technical and vocational education and training in Indonesia.

Recognizing the need to change technical and vocational education in order to meet the new challenges, the Minister of Education and Culture has set up a Task Force (1) to formulate a national technical and vocational education and training system and (2) to recommend strategies in the development of the system. A report has been presented to the Minister of Education and Culture in December 1995 with the title "Skills Toward 2020". This document is now being used as reference in the reformulation and reformation of technical and vocational education.

With all the attemps currently being made to improve the technical and vocational education system and plans for the future based on the preliminary results of the Task Force, it is obvious that major changes need to happen in the near future to move into the right direction. As identified by the Minister of Education and Culture, nine key policy shifts are needed in technical and vocational education and training in Indonesia.

Key Policy Shifts in Technical and Vocational Education And Training

	THE PAST	THE FUTURE
1	A supply-driven system on a large social demand	A demand-driven system guided by labour market signals
2	A schools-based system delivering 'diplomas' upon examination	An education and training system delivering 'competencies' in accord with nationally recognised standards
3	A school-based system with minimum flexibility in delivery	An education and training system with multiple entry/exit points and flexibility delivery
4	No official recognition of prior learning	A system which explicitly recognizes skills and 'competencies' wherever and however they are obtained
5	A school-based system with 'study-program' orientation	An education and training system oriented towards officially recognised professions and trades
6	Education and training focused on the formal sector	Education and training both for the formal and informal sectors
7	Separation between education and training	Full integration of education and training from a cognitive science perspective
8	Centralised system of management	Decentralised system of management
9	Institution/organisation fully supported and run by the central government	Self supporting and self managing institutions or organisations with partial support from the central government.

The shift to future policy is among others through the development and implementation of broad based curriculum, Pendidikan Sistem Ganda, production unit, school management and management information system.

THE IMPLEMENTATION OF PENDIDIKAN SISTEM GANDA

Pendidikan Sistem Ganda (PSG) is the term used for a dual system of education implemented at technical and vocational schools and its partners from the world of work. Teaching learning activities in schools is complemented with learning by experience under real and relevant conditions in the world od work. The objectives of PSG are:

- To produce qualified skilled workers with the required level of knowledge, skills and work ethics as needed by the world of work;
- To strengthen linkages and cooperation between technical and vocational schools and the world of work;
- To increase the efficiency of education and training process required to produce qualified workers;
- To acknowledge and appreciate work experience as part of the education process.

The typical differences between the conventional system and Pendidikan Sistem Ganda are as follows:

	CONVENTIONAL SYSTEM	PENDIDIKAN SISTEM GANDA
1	Practice activities are conducted in schools only: a. Simulation (artificial) in nature b. Provide only basic skills	Practice activities are carried out in school and in industries/world of work: a. Basic practice could be done either in school or in industries/world of work b. Professional competencies are developed through doing real work in industries/world of works
2	Behaviour and Value System at Schools: a. Less concerned about time discipline b. Less concerned about correct working procedure c. Outcomes are assessed in grades which are not used in industries/world of work	By adopting Working Behaviour and Value System from industries/world of work a. Students more concerned about time discipline b. Students are more concerned about correct working procedures c. Assessment of outcomes: Accepted or Rejected
3	Teaching is based upon subject matters.	Teaching is oriented to achieving required competencies.
4	The schools are less concerned about graduate employment.	The school is concerned with the marketing of their graduates and their employment.
5	Teaching programmes/curricula are designed unilateraly by MOEC	Teaching programmes are designed and agreed upon by the school and MOEC industries/world of work.

PSG basically belongs to, and is under the responsibility of, both the technical and vocational schools (Sekolah Menengah Kejuruan = SMK) and the School Partner. Therefore the education and training programmes to be provided should be designed and agreed upon by both parties with particular regard to:

Professional or Competency Standard of Graduates

PSG is directed to produce graduates with standardized qualifications which meet the needs of the world of work. The standard of qualification and competencies of graduates would have been agreed by the school partners.

Education and Training Standard

To ensure the achievement of agreed competencies, standards of education and training provided should be designed and agreed upon with particular regard to:

- Content or materials to be studied by students when they learn in SMK, as well as when they learn by experience in the school partner. The content or materials of instruction and training shall refer to the SMK Curriculum which contains: a *Normative Component* (personality and character building), an *Adaptive Component* (self development capability), and a *Productive Component* (Working capability, consisting of vocationial theory, vocational basic practice, working skills and practice).

- Time required for the students to master all of the required skills, through the SMK as well as work experience.

- Implementation Pattern: based upon the condition of each SMK and school partner, decisions as to the implementation pattern which best suits the conditions of work experience for instance: *Block Release, Day Release, Hour Release*, or a combination of the three should be stipulated.

Standard of Evaluation System and Certification

To guarantee the expected quality of graduates, a system of standardized skill testing (competency and profession test) should be established. Students who pass the tests would be awarded a certificate stating the qualification and capabilities achieved, certifying the ability to perform duties in line with his/her specialization.

The implementation of PSG requires the involvement of many parties, therefore it is deemed necessary to establish a council for cooperation,

coordination, and consultation called the National Council for Vocational Education, or *Majelis Pendidikan Kejuruan Nasional* (MPKP) at the national level. A Provincial Council for Vocational Education, or *Majelis Pendidikan Kejuruan Propinsi* (MPKP) at the regional level, and School Council, or *Majelis Sekolah* (MS) at each SMK would support the activities of the National Council.

Cooperation between the SMK and its school partners in implementing PSG would be arranged and developed to the mutual benefit of both parties. Both parties would be encouraged to develop and use opportunities and resources available on both sides. The involvement of many parties in the PSG implementation requires transparent regulations which stipulate the working mechanism of the institutional organization at each level, and set out the rights and obligations of each participating party, to ensure the sustainability of the programme. Until regulations are made, the implementation of PSG should be regulated through an agreement made between the MOEC organization (especially SMK) and the Industry/Firm/Company which serves as the school partner.

Through a Joint Decree between the MOEC and Chairman of KADIN Indonesia no. 0267a/U/1994 and no. 84/KU/X/1994 dated 17 October 1994, a National Council for Vocational Education (MPKN) has been established, with Provincial Councils for Vocational Education (MPKP) at the regional level, and a school Council (MS) at each SMK. The Councils are intended to enhance the relationship between the government (represented by MOEC, and other relevant Ministries or offices) and the world of business/industry (represented by KADIN Indonesia and other relevant organizations).

MPKN is assisted by professional groups (Kelompok Bidang Keahlian = KBK) consisting of experts and representatives of the world of work. These groups are responsible for developing national competency standards, education and training standards, evaluation system and certification, accreditation system.

The school Council or Majelis Sekolah (MS) play an important role in the implementation of PSG. The main duties of an MS, among others, are as follows:

- To coordinate the validation of educational materials and implementation of PSG at school as well as the school's partner;

- As a facilitator for the SMK in exploiting the potential and encouraging the world of business and industry to become school's partners;

- To establish an evaluation and certification system team, and create a condusive atmosphere for implementing the system which takes into consideration the needs of the world of work;

- To market the graduates of PSG.

An extensive Monitoring and Evaluation system is developed to evaluate school performances in all aspects of technical and vocational education. Results of the monitoring and evaluation is used to give guidance and supervision to schools.

Appendix 2

Data of technical and vocational schools at the end of PELITA V (1993/1994)

Field Group	Types of School	Number of Schools	Number of Students	Number of Graduates	Number of Teachers
Agriculture and Forestry	Public	37	19,573	5,549	1,308
	Private	213	30,132	4,843	3,798
	Total	250	49,705	10,392	5,106
Technology and Industry	Public	181	175,838	40,355	16,173
	Private	899	378,867	85,953	25,077
	Total	1,080	554,705	126,308	41,250
Business and Mana gement	Public	340	237,662	71,316	13,888
	Private	1,616	474,360	122,399	35,054
	Total	1,956	712,022	193,535	48,942
Tourism and Hotel	Public	92	6,570	3,370	3,367
	Private	148	48,556	5,584	3,189
	Total	240	95,126	18,954	6,556
Community Welfare	Public	15	9,663	1,081	458
	Private	72	12,446	1,700	1,524
	Total	87	22,129	2,781	1,982
Arts and Crafts	Public	38	21,901	2,522	1,303
	Private	34	15,882	537	617
	Total	72	37,783	3,059	1,920
Total	Public	703	511,207	134,013	36,497
	Private	2,982	960,263	221,016	69,259
	Total	3,685	1,471,470	355,029	105,756

Technical and Vocational Education in Japan

by

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CHARASTERISTICS OF TECHNICAL AND VOCATIONAL EDUCATION IN JAPAN

A country poor in natural resources such as Japan has no choice other than relying on the cultivation of human resources to develop the nation. In the process of modernizing the nation, enhancement of the national education has been of the first priority and put great efforts to foster technical and vocational competence at all people from children to adults. The government has taken very strong initiatives on the technical and vocational education(TVE) since the renovation of this nation in the middle of nineteenth century. Introductory technical and vocational education was most concerned at the lower secondary level after the last world war, but gradually moved its emphasis toward upper secondary level in the seventies. The labour union in this country takes very limited contributions on technical and vocational education in comparison with those in western countries. Big enterprises provide training facilities and vocational training within industries, while small enterprises relay on OJT or public vocational training centres.

Technical and vocational education in present schools is not a dual system in its strict sense. TVE in formal education is provided at the lower and the upper secondary levels under the supervision of the Ministry of Education, Science, Sports and Culture(MONBUSHO) and the Prefectural Boards of Education (Japan is divided into forty seven administrative units, called 'prefecture'). The Ministry makes public the Courses of Study for elementary education(for six years in the primary school), lower secondary education(for three years in the middle school) and upper secondary education(for three years in the high school) and revises them almost every ten years. They describe instructional objectives and contents of every subject at every grade of each educational level. The Courses of Study for the elementary and the lower secondary education are, though, legislatively required to be strictly followed. The course for

upper secondary education must also be respected but is permitted to be modified with flexible interpretation according to local needs and professional specialties. Technical and vocational education at the secondary level is implemented and monitored in this manner.

Technical education at the lower secondary level aims to foster not vocational competence but functional literacy for the dairy life of citizens. This subject is often cited under as the name of 'industrial arts', but has no vocational nor professional feature. It includes wood work, metal work, electricity, mechanics, cultivation, basic information technology, food, nursery, clothing, housing and child care as literacy for life. Seven out of these eleven areas should be elected and taught in every middle school.

Ninety seven percent of graduates from middle schools advanced to high schools in 1995. General and vocational courses were provided for them in high schools since 1948, the year of the first establishment of the postwar school system. In 1994 after 46 years later, another course was established to provide students with a wider range of subject choices for their career paths. This course was named the "integrated course". The present high school courses, therefore, consisted of three types: the general course, the specialized course and the integrated course. Instructions is provided mainly in full day courses, but evening courses are operational in credit-based high schools for flexible time tabling of students. These courses are presumed to be equivalent in their legislative status, but in reality the general course is highly appreciated for its continuity to higher education, and the specialized course on the other hand is often regarded as less relevant to the path to higher education. Entrance admission to universities is assessed by the scholastic score of non-vocational subjects, resulting in the disadvantages for students in vocational courses. The integrated courses are partly established to improve this situation and aimed to integrate the conventional general course and the vocational course.

The conventional vocational courses are not directly subject to the requirements of industry. Instructional objectives and contents in the Course of Study are always decided by the Ministry, but amended or modified by teachers according to their necessities and judgment. Teachers are usually graduates of professional faculties in universities and very few of them are from industries. This background of teachers is due to the fact that the teaching certificate requires bachelor degree as its

prerequisite and teachers come to vocational schools immediately after their graduation without any practical experiences in industries. This lack of experiences results in their teaching putting the emphasis on theoretical aspects of vocational education and in a lack of practical content in the learning. This emphasis in my interpretation, however, brings some positive as well as negative influences on vocational education at the upper secondary level.

The positive aspects of theory-oriented instruction are that the graduates of vocational high schools who are employed in small manufactures introduce modern technologies and are welcome by the enterprises intending to renovate their technologies. In the era of fast developing technology, enterprises are willing to employ youngsters competent in the theoretical comprehension of new technologies. The vocational schools established in the sixties and seventies were usually well equipped with modern facilities to cope with the technological development. On the other hand, big industries can afford to give additional training within work force. They welcome youngsters with basic knowledge and comprehension rather than instantly trained manual skills which are immediately usable after coming to the work place, but easily become obsolete. This expectation was sustained until the seventies, but later not fulfilled due to a decline of the student ability.

Negative aspects of the lack of practical emphasis in courses are that the instruction tends to loose the meaning in learning for students. Those who are not competent in abstract thinking or not interested in gaining professional expertise are irritated by such instruction and dropout of schools. Especially in the present system of articulation from middle school to high school, the career guidance provides is not sufficient and is problematic. Students choose their career paths referring not to their interests or abilities but to the scholastic score in middle schools and the ease of entrance examination of specific high schools. School ranking from the viewpoint of the scholastic score threshold of entrance examination and its social reputation is strongly perceived among students, parents and even teachers. This distorted situation in education is the urgent and crucial problem in this country.

This is why the Ministry took initiatives to implement Educational Reforms successively in the last two decades. To understand this situation, it is better to describe a short history of vocational education in the postwar era and analyze the relationship between the success of the

drastic development in modern industries and the present problems in education caused by such fast development.

A SHORT HISTORY OF VOCATIONAL EDUCATION IN JAPAN

Since the end of the last world war in 1945, the first priority of national policy for reconstructing the nation has been to enhance the education from elementary to tertiary levels in the belief that the nation is reconstructed not by natural resources but by human resources. On 15 September of the same year, the government issued "Educational policy for the construction of new Japan" and showed a future plan for the direction of new Japanese education. Vocational education was one of the most emphasized national needs for economic development to recover the living condition of citizens from the disastrous destruction during the war. Curriculum for new middle schools enacted in 1947 included vocational courses providing five elective subjects of industry, commerce, agriculture, fishery and home economics. This vocational education at lower secondary level was converted to more general industrial arts and home economics in 1958 and lost its vocational education feature. A new school system at upper secondary level started in 1948 and had two streams, one of general and one of vocational education, covering a wide range of various occupational subjects. The "Vocational Education Promotion Law" enacted in 1951 accelerated the renovation of vocational education at the upper secondary education. The second renovation movement started in 1958 to respond to the Five Year Plan for Economic Independence initiated by the government. This movement resulted in the increase of enrollment capacity, renewal of training equipment and establishment of new training institutes for industrial teachers within nine major national universities.

This tendency continued until the middle of the seventies. Many vocational high schools were constructed, equipped with high quality machinery for practical training and renewed instructional contents responding to requests from the industry. During this period, these schools received competent students from labour class families with expectations of their future prosperity in professional career paths. The first surge of the "baby boom" due to the high birth rate immediately after the war reached high school level in 1963, and required the expansion of enrollment capacity. In the sixties and the seventies along with this surge of applicants, Japan was experiencing an overwhelming

development in its industries and economy. Export oriented production policy in heavy industries required a quantity of skilled labours equipped with new technology at the technician level, but only a few highly talented engineers having creativity and imagination to initiate entirely new and innovative industries. In 1966, the Council for Science Education and Industrial Education issued a report titled "Diversification of Vocational Education at Upper Secondary Level" and proposed an increase of subjects. Responding to this proposal, the Ministry decided to enlarge students' choice up to 250 different subjects. New plan to enhance information processing education in vocational high schools started in 1969 to subsidize local boards of education in the establishment of an Information Processing Center in each prefecture for practical training in programming.

As a developing country in the international trade at that time, Japan adopted new technologies imported from developed countries and improved them qualitatively to achieve the most sophisticated quality control on the production and assembly lines in various industries and succeeded in exporting modern technological products all over the world. This technological innovation continued in the seventies and explored new original electronics technologies. The success of new technological development expanded in other technological areas and drastically increased Japan's surplus in international trades. During this period of development, vocational education was designed and directed to echo the voice of industry. Until this period of expansion in the seventies after recovery from the destruction of war, vocational education in Japan was intended to supply high quality labours to the explosively developing industries. The industries gradually realized the necessity of employing high quality engineers and requested that the government enlarged the enrollment capacity in scientific and technological departments of universities. This demands for highly qualified labours during the seventies ignited the another enthusiastic fever of sending children on to universities. Japanese education became excessively competitive and geared more and more toward the entrance examinations for universities through general courses in high schools.

FROM INDUSTRIAL REQUIREMENTS TO INDIVIDUAL NEEDS

The astonishing development of Japanese industries and the amazing expansion of its international trade and high domestic consumption of

dairy goods stimulated a variety of industries to explore new business, enlarged employment opportunity, brought high living standard among people and achieved very prosperous life style. Along with the gradual improvement of living standards, parents raised their aspirations in education to sending their children to general courses rather than vocational courses with the expectation of their continuing studies up to higher education. The total number of high schools increased drastically to receive ever increasing number of students, e.i. the second surge of "baby boom" in the late eighties and early nineties after roughly twenty five years of the first surge (Figure 1). Caused by such enthusiastic expectation on higher education, the proportion of general and vocational courses in high schools changed and resulted in the decrease of the student portion in the vocational course as shown in Figure 2. This shrinking of applicants to vocational schools also resulted in decline in the standard of vocational instruction.

The report entitled "Improvement of Vocational Education at Upper Secondary Level" issued in 1976 was a turning point of vocational education in this country. This report emphasized the following viewpoints.

- Basic education is indispensable and should be included in the specialized course as well as the general course. It should foster not only scientific knowledge but also competence to solve problems creatively through practice;

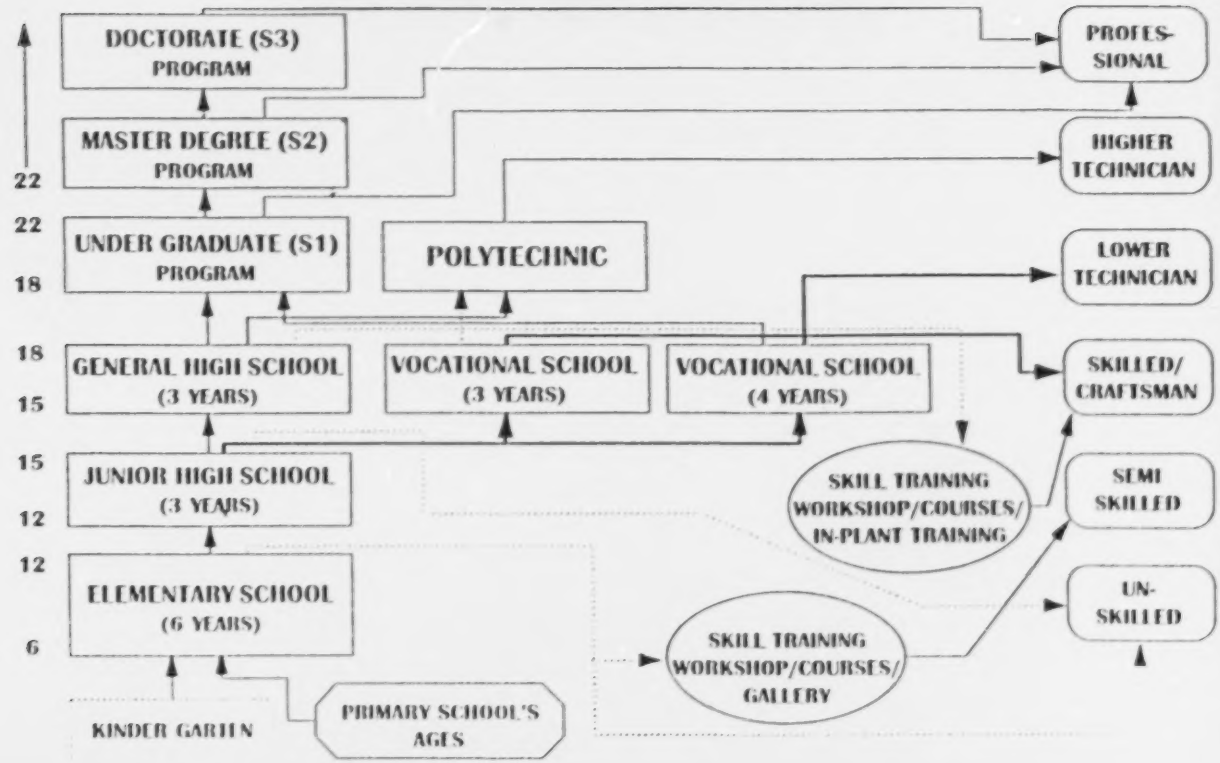
- Flexibility in a credit-based system is emphasized to enable students to plan their learning to fit their interest and concerns including their intention of sitting for the university entrance examination.

- It allows for reorganization of a variety of vocational subjects to modernize their instructional contents;

- The emphasis on practical and empirical learning in schools and daily life is expected for children in elementary schools, middle schools and the general course in high schools as well as in the vocational course.

The Committee of Vocational Education under the Council of Science Education and Vocational Education which further scrutinized this policy,

EDUCATION AND EMPLOYMENT STRUCTURE



made public a first draft in 1981 and reported it to the Minister of Education in 1985. The report suggested to:

- establish information technology in every course besides industrial and commercial courses;
- diversify and make flexible the curriculum of vocational education to respond to students' interests and concerns;
- make use of different facilities in unanimous collaboration of schools, industries and local communities, and develop an exchange scheme of credits with other schools; and
- enhance vocational education in general courses.

EDUCATIONAL REFORMS IN SCHOOLS

We recently faced another transitional period in the history of vocational education. The rapid expansion of entrants in upper secondary education was thought ideal for equal opportunity for education and for responding to the citizens' expectation. Figure 2 shows the rapidly increasing population of students in high schools. Educational administrators energetically responded to this demands, forgetting the real needs of students with a great diversity in abilities, aptitudes, interests, concerns and career paths.

The general courses were popular for the convenience of applying for the entrance examinations of universities and other tertiary education. Aside from such preference for general courses, vocational education itself could not attract the interest of students and stimulate their learning curiosities. This resulted in a decrease of applicants for vocational education and also a high dropout rate from high schools. Instructional contents in vocational courses became obsolete, mainly due to the ceaseless development of technologies, poor opportunity for refreshing the professional knowledge of teachers and out of date equipments in the eighties after intensive investment during the sixties and seventies. In 1991, the Central Council for Education issued a report titled "Reforms of Various Educational Systems to Adapt Them to a New Age", which highlighted urgent problems to be solved by all concerned people in education. The phenomena of delinquency, violence in schools, high

dropout rate, bullying and suicide were interpreted as the maladjustment of the school system to the real student life and caused by excessive emphasis of formal schools on competition in entrance examination and meaningless learning.

There are two tendencies of renewal projects in the high schools; deeper specialization of vocational courses and establishment of integrated courses. Since the issue of the report from the Central Council of Education in 1991, vocational schools at upper secondary education are called 'specialized high schools' to give a new flavor of vocational education to youngsters. Integrated courses are provided for those who are uncertain in their future career paths at the time of graduation from middle schools and want to have a variety of experiences before they decide definitely their future careers. It is expected to establish at least one high school having the integrated course in each prefecture with the purpose of examining a new type of education at the upper secondary level. On the other hand, specialized courses are renewed in curriculum and instructional facilities to respond to more advanced professional needs. This specialization is related to local needs of industries neighboring the school or the demand of applicants from wider areas in the nation. Successful examples of such renovation are illustrated in the table 1. Local boards of education gradually shifted their efforts from responding to the voice of industries to those of parents and children. This shift reflected the change of social expectation on the development of this nation. The welfare of citizens became more appreciated through a spiritually happy life than through the economic development of the nation as a whole. Educational policy increasingly emphasized the importance of children's individuality and autonomy in deciding their future careers in respect of their own interests and abilities.

RECENT TENDENCY OF VOCATIONAL EDUCATION IN JAPAN

Society is changing very fast. It is very difficult for students to decide their future vocation at an early stage. In the past, children felt satisfied to succeed their parents' occupations, or able to see their future among neighbours' professions. In the modern technological society, children are isolated from the real vocational life of adults and find it difficult to imagine their future vocation. The only certain path to the future for children is to follow formal education and to explore the possibilities available, depending upon their scholastics achievement.

In the sixties and seventies in Japan, to live a prosperous life was the strongest expectation among people and key to selecting professional career path. Recently after fulfilling the first priority dream, people are very concerned about self-realization rather than pursuing economic prosperity for themselves. Professional sportsmen, musicians, singers and other free workers are often highly appreciated among young people, influenced by TV programmes. New fields are attractive to younger generations, such as life science, environmental industry, international business and so on. Traditional disciplines provided in conventional formal education do not necessarily fit the demand of younger generations. Those who have clear goals for their future occupation are not satisfied with the present obsolete curriculum and facilities provided in the formal school.

Japanese society is characterized by high dependence on academic achievement to plan one's future career path and on educational institution ranking or school ranking to improve one's living condition. People believe that success in school grantees their future promotion in any occupations, whether in public services or in industries. This expectation has been heated by the excessive competition of university entrance examination.

We are experiencing a radical change of concepts in vocational education at upper secondary education and in life-long learning perspectives. This change requires us to implement the educational reform scheme initiated by the Ministry in the last two decades. The ministry issued many recommendations or reports successively through various councils, committees and working groups. Educational reform ranges from kindergarten to universities, from curriculum to administration and from national universities to private universities. Vocational education is also affected by this reform movement.

Reform of vocational education at secondary education level is closely related to the national reform scheme of education as a whole fromelementary to tertiary levels. During the last four decades after the last world war, the most urgent problem of national education was to provide educational facilities to accommodate the ever increasing requirement for enrollment capacity in high schools and universities. The construction of school building, the subsidy of personnel costs and the provision of new facilities consumed the local financial capacity. Now having achieved a high percentage of school participation and a

quantitatively stable situation of education, qualitative improvement is strongly requested by parents, students, teachers and even administrators.

The project for qualitative improvement of upper secondary education can be described as follows:

- respond to the diversity of students' abilities, aptitudes, interests and career paths and to respect the individuality of students;
- alleviate the excessive competition in entrance examinations, taking into accounts students' talents and individuality;
- make flexible school transfer, course change and readmission to facilitate the change of career paths;
- To introduce credit-based curriculum for students to formulate their learning plans easily and enthusiastically;
- prepare students develop perspectives of the working world and to enhance a sense of self and professional awareness.

There are three distinct trends in vocational education in Japan. One is to renovate the conventional curriculum and facilities in specialized schools to respond to the expectation of entrants and of industry. The second is to establish integrated courses. The third is the increasing tendency of workers to gain professional qualifications through examination for professional certificates as a part of the life-long perspectives. These trends can be described as, (1) renovation of vocational education in conventional courses, (2) establishment of new courses attractive to students, and (3) life-long learning perspectives in vocational education.

RENOVATION OF CONVENTIONAL COURSES AND ESTABLISHMENT OF INTEGRATED COURSES

Along with the increase of applicants to general courses and decrease of applicants to vocational courses, the number of courses shrank and many courses were abolished in the eighties and the beginning of the nineties.

In the Kyoto prefecture as one case of illustration, one course of agriculture was abolished in 1983, six courses of commerce in 1985, three courses of home economics in 1990, two courses of commerce in 1992, and one course each of industrial chemistry and of commerce in 1993. Instruction in conventional vocational courses was obsolete and teachers were reluctant to change either curriculum contents such as typewriting, abacus and book keeping, or their way of teaching. It was essential to renovate conventional vocational education.

During this shrinking period in the Kyoto prefecture, one new commercial high school having courses in accounting, information processing, distribution economy and international economy was established with sophisticated facilities and an entirely new curriculum. One high school of fishery was converted to a school having sections of ocean production, marine technology and marine economy. The ocean production section is divided into a fishery production course and artificial cultivation technology course. The marine technology course provides students with modern technology such as bridge building in the sea, marine surveying and measurement, metal welding in the sea. and a variety of marine sports. Courses of an agricultural school were converted to biotechnology courses of agriculture and animal husbandry. In other high schools, many courses were renovated around 1990.

Aside from the renovation of the conventional vocational education, great efforts were made to change the concept of upper secondary education by integrating general and specialized courses. In the general course, the five major instructional subjects (national language, mathematics, science, social studies and English) are intensively taught in the form of cramming knowledge with the goal of high scores in the entrance examination. Practical education is ignored or entirely out of the curriculum except arts and physical education. More than ninety seven percents of students who graduated from middle schools go to high schools, but not all of them are necessarily interested in the acquisition of the abstract knowledge described in textbooks and irrelevant to their dairy life. There is in the current curriculum nothing which preparenon-academic students to move to work place.

On the other hand, instruction in the specialized course is more professional in order to satisfy students already having clear plan of their career paths and wanting to be trained in specialties. This course is not appropriate to those who are not confident of their specific talent and who

are enable to decide their future career paths yet. The integrated course is aimed to provide such students with instruction relevant to their concerns for future occupation and with practical experiences interesting to them. Table 1 shows the number of newly established integrated courses since 1994.

Table 1: Number of integrated courses

	number of courses
1994	7
1995	16
1996	22
1997 (expected)	29
Total	74

The integrated course scheme is still under trial and being challenged in many high schools. There is no definite pattern of curriculum nor uniform provision of facilities. Examples of new types of upper secondary schools are introduced by the Ministry as shown in Table 2.

Table 2: Examples of new upper secondary schools

Characteristics	Upper secondary schools
Establishment of multiple courses, provision for selection of subjects across course boundaries	Tochigi Prefectural Utsunomiya Hakuyo High School (courses in agricultural management, biological engineering, food science, agricultural engineering, information technology, distribution economics, fashion design; established in 1991) Shizuoka Prefectural Shuchi High School (courses in life sciences, electronic engineering, distribution economics;established in 1991)
Provision of diverse range of courses and subjects from which students can choose freely	Saitama Prefectural Inagakuen Comprehensive Upper Secondary School (general course; established in 1984) Miyazaki Prefectural Honjo High School (established in 1991)
Improvement of foreign language education to keep pace with internationalization; active acceptance of Japanese students returning from abroad and foreign students	Tokyo Metropolitan Kokusai High School (international course; established in 1989) Chiba Prefectural Narita Kokusai High School (international cultural studies course; established in 1992)
Establishment of information-related courses in industrial and commercial fields to prepare students for the shiftto an information-oriented society	Fukushima Prefectural Seiryo Joho High School (courses in information electronics, electronic engineering, data processing, computerized accounting; established in 1988) Oita Prefectural Information Science High School (courses in information electronics, information management, distribution economics;established in 1988)

After the first establishment of integrated courses in 1994, many prefectures have joined to this new scheme of vocational education. Some of them are renovated from the conventional courses, some are integrated of general course and specialized courses and some are established as entirely new high schools. The characteristic feature of integrated courses is its variety. Table 3 shows name of major courses and its number.

Table 3: High schools having integrated courses (as of 1996)

name of major courses	number of courses
Information technology	49
Traditional culture	4
Industrial technology	20
Distribution industry	33
International business	40
Local affairs	15
Marine industry	1
Manufacturing industry	12
Welfare industry	32
Art	29
Life sciences	37
Environment industry	23
Sports or physical education	31
Humanities	37
Natural science	41
Social science	6
Others	5

TOWARD VOCATIONAL EDUCATION IN THE LIFELONG LEARNING SOCIETY

In the past, Japanese companies were presumed paternalistic and kind enough to look after their employees for their whole working life, and the employees were entirely loyal to the companies. Employers in big companies felt responsible for the ceaseless refreshment of expertise to employees and for the conduct of training within industries from the very initial working stage to executive levels. This was a typical feature of the relationship between employers and employees in traditional Japanese companies.

Present companies, however, cannot afford to guarantee such life-long employment in rapidly changing and competitive society. Nobody can look forward to a permanent contract of employment with any company. This phenomenon brings an increase in workers who have lost their lifelong loyalty to a single company, wanting to be independent from any specific company and getting confident of their professionalism within the competitive working society in a global scale. The loyal relationship

between employers and employees, and heavy dependence on years of experiences in one specific company is fading out and competency-based contract is becoming more attractive to both partners. Meritocracy is gradually penetrating into Japanese industries. Many employers are restructuring their enterprises and firing employees in some cases without any precautions. In this uncertain working environment, professional qualifications certificated outside of companies are looked for by employees and becoming quite common among workers. There are more than 600 different qualification certificates. Some companies recommend their employees to obtain professional certificates governed by outside professional societies or associations to improve their professional quality. Table 4 shows the number of applicants to the technical qualifications.

Table 4: Number of applicants to technical qualifications (as of 1992, Takemura, 1994)

Name of Certificates	No. of applicants
Professional Engineer(2nd examination)*	10,047
Patent Attorney	3,279
Incharge Electric Engineer	24,579
Incharge Gas Engineer	9,949
Incharge Telecommunication Engineer	10,508
Consultant in Industrial Safety and Hygiene	589
Administrator in Pollution Prevention	19,803
Administrator in Hygiene	41,849
Specialist in Handling Dangerous Articles	410,33 1
Information Processing Engineer	394,72 0
Total	923,65 4

(*:Japanese Professional Engineer is equivalent to American PE or British Chartered Engineer(CE))

Results of a survey show that 37.8% of the applicants to such qualifications make an effort to learn by themselves, 47.1%atprofessional schools or institutes, and 15.1% at miscellaneous ways.

Our constantly changing society requires the ceaseless renewal of knowledge and competencies, especially professional expertise to all working people. This continuous updating of professional knowledge and skills is not satisfied only by the conventional formal education system. To be able to learn any subjects anywhere and anytime independently or in a group is indispensable in the twenty first century to cope effectively with an uncertain future. Nobody can prepare his/her career paths at school age. Vocational education also needs to be overhauled from the viewpoint of a life-long learning society.

In the past, preparation toward a professional career was the most appreciated function of vocational education. A well organized training scheme was ideal to supply talented labours for industries. The situation is changing. Anybody should be able to access to the educational institutions and refresh his/her professional competence anywhere and anytime. In this context, the following considerations are needed.

1. To make the vocational schools accessible to the public.
2. To foster learning abilities at student age.
3. To utilize information technologies for providing wider learning opportunities.
4. To accumulate instructional information accessible by the public.

The Ministry established the University Reform Council in 1986 and the University Council in 1987 following the recommendation of the National Council for Educational Reform. Since then the University Council made public more than fifteen reports concerning the university reform. They cover every aspect of universities such as the flexibility of graduate schools, the improvement of university education, the evaluation of graduate schools, the improvement of junior college education, entrance examinations, degree regulation, university administration and so on. They include the improvement of open education to the public.

Along with these reform schemes for higher education, it is now also expected for universities to provide professional education for people in industries. The Education Committee of the Japan Federation of Employers' Association (Nikkeiren) issued a report "University for Industry People" in 1992 and "University Education to Meet the Challenges of a New Era and the Business Sector's Approach" in 1995. The Japan Federation of Economic Organization (Keidanren) proposed "Structural Reform and Education in the New Era of Respect for the

Individual" in 1993. The Japan Association of Corporate Executives (Keizai Doyukai) issued their proposal of "the Role of Universities in an Age of Widespread Higher Education: Reforms Targeted to the Motivation and Ability to Learn" in 1994. There are many other proposals from different associations or parties on the reform of universities, emphasizing the necessity of modifying education to make it more suitable to people in industry.

These reforms are under discussion within universities and gradually taking concrete forms. It is still necessary to wait for a while to see the ultimate structure of higher education in this country. The trends in educational reform in universities can be found in the report issued by the Ministry in 1995.

Colleges of technology are another influential type of institution in vocational education in Japan. Those colleges were established in 1961 to provide practical education in advanced technologies and to supply middle level engineers to the rapidly growing industries at that era. Colleges receive graduates from lower secondary schools and give five-year instruction intensively in new technologies. Graduates of these colleges have enjoyed high reputation among technological enterprises. Non-formal educational institutes, junior colleges and universities are all gradually open their doors to the public and provide a variety of vocational education.

It is indispensable to construct a lifelong learning society to cope with economic, societal and technological changes which are never ending. The construction of a lifelong learning society is not construction of specific schools nor institutes. It is rather the coordination of different administrative measures to promote all sorts of activities including culture, sports, education and social events. In the context of this scheme, technical and vocational education for adults is also one of major area to be enhanced. The Ministry established the Lifelong Learning Bureau to coordinate all activities related to lifelong learning,to avoid the harmful effects of a society preoccupied with academic credentials. Specialized schools, colleges of technology, universities and other private educational institutions are expected to be core of activities, to open their facilities to the public, to invite local human resources as instructors and to provide the public with the expertise of professional personnel.

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The Promotion of Linkage between Technical/Vocational Education and the World of Work in Korea

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SUMMARY

The shortage of craftsmen in the manufacturing industry stagnates economic development, weakening the basis of Korean economy. The government recognizes the existing Technical and Vocational Education system needs to be widely reorganized. Along with this, the era of globalization and the advent of the information society suggest many implications for the future direction of TVE system.

The Korean government has recently set out a plan to restructure the entire technical manpower education system within the "New Five Year Economic Development Plan." It includes the introduction of the [2+1 system] to technical high schools. The main purpose of the system is to raise the workplace adjustment skills of technical manpower by offering on-site training. The purpose will be realized by motivating industrial firms to take an active role in cooperative system with technical high schools and maximizing the utilization capacity of human and training resources between firms and schools. There have been different responses to this system from diverse sectors in society. Those who support this system claimed that it helps technical high school education actively respond to the changes, not only in quality but also in quantity of manpower needed in industries. Nevertheless, teachers in technical high schools are critical of this system. Though they agreed with its main principle to strengthen the relevance of school education to the needs of the industries, they see some problems intrinsic to the system.

Korean Government has started reform of TVE from 1996, and it included powerful measures to improve the linkage and cooperation between TVE and the world of work.

The scope of school-industry cooperation will be extended to provide students of vocational high schools with on-site training. The duration, time and type of training will be managed flexibly. The curriculum will be organized and administered in cooperation with the industries. The regional "Vocational Education and Training Council" will be strengthened with the participation of industries. Business personnel from industry will be encouraged to take a part in the School Council. As a measure to upgrade the quality of education for vocational high schools, personnel from various industries will be invited to conduct practical classes while in-service training for regular teachers will be enforced.

The New University System will be introduced to raise the overall educational standard of the adult population engaged on economic activities. This system will enable them to further education without leaving their place of work.

The links between vocational education programs and the qualification obtaining process will be strengthened to expand an adequate on-site education system. In the case of skilled technicians, they will be able to receive their certification without having to take a test if they have successfully completed programmes in a vocational high school and a vocational training center.

TVE System in Korea

TVE System

This paper focuses on the secondary TVE in Korea. Korean industrial manpower is educated and trained under the infrastructure shown in < Table-1 > . The TVE system consists of in-school education and out-of-school training.

Table 1 - TVE infrastructure in Korea

	Ministry of Education	Ministry of Labour	Industrial Firms	Private Centres
Graduate School	Graduate School		In-Plant Graduate School	
University	College of Engineering Open University	Korea Institute of Technology and Education	In-plant university	
Junior College	Vocational Junior College	Industrial Masters' College	In-plant Vocational Junior College	Special Programme
High School	Vocational High School	Vocational Training School		General Programme

The Korean education has a typical 6-3-3-4 ladder system: six years of elementary school, three years of middle school, another three years of high school, and two or four years of higher learning. Professional TVE is delivered through vocational high schools in various fields. They are divided into agricultural, technical, commercial, fishery & marine schools. There are also vocational schools with two different vocational programs, and comprehensive schools incorporating both the general and vocational programs. Besides, a number of general high schools offer various programs called 'vocational classes' for students who decided not to enter college but want to get jobs.

Partnership between School and Industry

Increasing demand for technical manpower and growing sophistication of production technology makes it inefficient for the school to have the entire responsibility for TVE. The function of training specific skills for technical manpower needs to be relegated to vocational training within firms. In doing so, while schools can provide the foundation for job performance, industrial firms can increase the immediate utility of skills upon employment of technical manpower.

In this respect, the effective cooperation system between school and industry has been needed to supply high-quality industrial manpower timely for economic development in Korea. However, while the school system has mainly played the role of training and supplying industrial manpower, private firms have neglected this role. Many people have criticized that these private firms were accustomed to accepting and utilizing the trained manpower, while neglecting their share in training prospective industrial manpower. In addition, limited is the current share of the private firms in providing financial inputs to train the manpower that they would employ. Unstable cooperation system has been considered as one of the blocking factors for efficient TVE in Korea.

SOCIAL CHANGE AND TVE

Restructuring Supply System of Technical Manpower

Owing to a series of active manpower development policies by the government, the Korean firms could obtain abundant and various manpower needed for industrial development from the 1960's to the mid-1980's. Since then, however, Korean economy has suffered from severe shortage of the experienced craftsmen. The main reasons were the unstable manpower structure, the negligence of in-service craftsmen training, and unfavorable social circumstances for craftsmen. As a result, industrial firms especially in the manufacturing sector had to go through severe manpower shortage(Korean Association for Technical Education, 1992: 67-8).

In the meantime, the importance of vocational high school as the prime base of supplying craftsmen has decreased since the beginning of the 1980's. The high school system has been predominantly college bound and has produced a batch of graduates who couldn't enter colleges but did not have skills to get jobs(Park, 1992: 18). The shortage of craftsmen in the manufacturing industry stagnates economic development, weakening the basis of national economy. In this context, the urgent task was to re-examine the whole system of the manpower demand and supply and to present improving measures at the national level(Song, 1992; Kim, 1993). The government recognized that the existing TVE system needed to be widely reorganized. From this recognition, an innovative educational policy, 'the High School Reform Policy,' was initiated in 1991. The purpose of the policy is to infuse aspect of TVE into the

secondary education system. For this purpose, the government presented measures to expand enrollment capacity of vocational education. According to these measures, the composition ratio of enrolled students between general and vocational high schools would be 50 % : 50 % by 1998.

Economic Development and Globalization

Korea owes much of its economic development to the strong desire of her people to educate their children, their steadfast devotion to nation-building and the leadership capabilities of the bureaucratic elites. The growth of Korean economy over the past three decades brought it to threshold of an advanced country status, with the 10th highest trade ranking in the world. Despite the splendid achievement in the economic field, Korea is not free from various problems that accompany rapid transformation of the economy. Korean goods encountered higher barriers in advanced countries, and the rising foreign debts imposed a severe burden on her export-oriented industry and balance of payment.

In recent years, the Korean Government has attempted to restore socio-economic stability, efficiency and balance. It has also sought to enhance international competitiveness of Korean exports, to enlarge employment opportunities, and to increase the well-being of people. Besides, it has maintained the open position of Korean economy to seek the cooperative ties with other countries in an era of globalization.

One of the most notable features of the social change in Korea in recent years is the globalization. Following the fall of ideological barriers and the emergence of the World Trade Organization(WTO), the world has become a "world without economic borders." We are now faced with a new era where our ideas, institutions and systems can no longer be protected by national boundaries. The concept of globalization is taken into account in designing a national survival and development strategy to meet the challenges of the next century. The era of globalization holds several implications for the future direction of TVE system. First, to meet the challenges posed by globalization, the quality of TVE should be raised to meet world standards. Second, to become truly globalized citizens, we should not only keep our minds open and foster a multi-cultural perspective, but also develop cross-cultural communication skills. Hence, it is needed to expand and emphasize the basic skills and attitudes including communication skills, foreign language, open mind,

etc. for students in TVE system.

Information Society

The advent of the information society has the important implication for TVE. First, TVE programmes for young people to acquire the skills necessary to earn a living need to be upgraded from secondary to tertiary education level. Second, life-long TVE should be an integral part of life in the era of information society, which will experience rapid changes and dissemination of knowledge. Third, the introduction of multi-media information technology into TVE will trigger revolutionary changes in the management of TVE systems, contents and teaching-learning methods.

Fourth, breathtaking advances in information and communications technologies are expected to alter our conventional concepts of classrooms, teaching-learning methods, curricula, and administrative aspects of TVE. Cutting-edge multi-media information technology will enable us to transcend the limits of time and space and to explore new possibilities in TVE. A student, for instance, may be able to listen to a lecture of his choice at the time of his convenience and learn it at his own pace.

SCHOOL-INDUSTRY COOPERATION SYSTEM AND CRAFTSMEN IN WORKPLACE

The [2+1 system] : A New Challenge of Technical High School

Background

As Korean economy has rapidly grown in the past decades, many educators and industrial personnel realized the importance of cooperative education at the secondary education level. In the past, the school-industry cooperation programmes were handicapped by the limited training capacity of plants, insufficient development of curricula, and insufficient placement of specialists to train student apprentices(Ministry of Commerce and Industry, 1993: 73). Because of these reasons, cooperative education has failed to seek a meaningful integration of academic study and work experience.

Faced with these problems, the Korean Government has recently set out

a plan to restructure the entire technical manpower education system within the "New Five Year Economic Development Plan." It includes the introduction of the [2+1 system] to technical high schools, which is similar to "Dual System" in Germany.

Purpose and Principles

The main purpose of the [2+1 system] is to raise the workplace adjustment skills of technical manpower by offering on-site training. The purpose could be realized by motivating industrial firms to take an active role in cooperation system with technical high schools and maximizing the utilization capacity of human and training resources between firms and schools.

Within the [2+1 system], students study two years for general education and basic skills in schools and join one year training program in industrial sites to practice and refine their skills. Curriculum, contents, and learning modalities within [2+1 system] far differ from those of traditional ones. Textbooks in major subject are modularized to fully integrate theory and practice and deal with basic theories and skills, based on the job analysis.

The outstanding differences of this system from the previous one are shown in <Table-2>.

<Table-2> differences of the [2+1 System] from the previous system previous system[2+1 system] operating method three-year study at school and 1-6 months practices in industrial sites practices as early employment two-year study at school and one-year practices in industrial sites educational contents theory and concept-oriented skills and job performance-oriented

The outstanding differences of this system from the previous ones are show in table 2

<Table 2> differences of the [2+1 system] from the previous system

	Previous system	2+1 system
operating method	three-year study at school and 1-6 months practices in industrial sites practices as early employment	two-year study at school and one-year practices in industrial sites
educational contents	theory and concept-oriented	skills and job performance-oriented

Participation

This system is being recognized as an epoch-making development in the history of technical education in Korea. About four thousands of technical high school students participated in this system in 1994, and about twelve thousands in 1995, and about fourteen thousands in 1995. Current status of participation of schools, students, and firms in [2+1 system] is shown in <Table-3>.

<Table-3 > current status of participation in the [2+1 system]

	N° of school	N° of student	N° of firm
1994	20	3,989	182
1995	68	12,631	855
1996	96	13,745	1,130

Expected Outcomes

The [2+1 system] is certainly not a panacea for all those problems, but it promises scores of benefits to students, schools, industrial firms and the Government.

Students

- On-site training using up-to-dated equipment in a real-work environment through apprenticeship could be offered;
- The job competence of technical high school graduates will increase and eventually help promote their employment prospects;
- The transition from school to work could be smoother;
- Access to the higher education from vocational training could be made easier.

Schools

- Up-to-dated curricula could ensure relevant teaching-learning;
- Teachers skills could be systematically updated;
- Better cooperation between schools and industry could be achieved.

Industrial firms

- Apprentices could be qualified and productive immediately after recruitment;
- A sufficient number of qualified employees with professional skills and attitudes could be ensured;
- Employers could participate actively in the development of curriculum. Therefore, they could have an influence on the content of education.

Government

- Technical education could be designed to combine the best features of both school-based education (broader knowledge, skills and attitudes) and on-the-job training (more specialized knowledge, skills and attitudes);
- A solid foundation for life-long vocational education system could be established;
- A more coherent dual system based on schooling and industry could be achieved.

Response and Developmental tasks

There have been different responses to this system from diverse sectors in society. Those who support this system claims that it helps technical high school education actively respond to the changes, not only in quality but also in quantity of manpower needed in industries (Park, 1992). Nevertheless, teachers in technical high schools are critical of this system (Kim, 1995). Though they agree with its main principle to strengthen the relevance of school education to the needs of the industries, they see some problems intrinsic to the system. Firstly, the government hastily introduced this system without serious consideration of its feasibility. Secondly, the government fails to develop proper curricula prior to the full-scale implementation. Thirdly, because of skeptical attitudes on the part of students and parents, it is confronted with some difficulties in operation.

In spite of these problems, a number of reports show that more people are getting supportive of this system. To make this system more effective, more policy measures will be taken. Above all, school curricula should be developed jointly with the industrial community. There are tasks which can be more effectively performed on a cooperative basis such as job analysis, information services on current trends in the job market, placement guidance and aptitude testing. Private firms should expand opportunities of on-site training for [2+1 system] students and take more positive and active attitudes toward the system.

Technical High School Graduates at Workplace

Employment Opportunity

Employment rates of vocational high school graduates for the last 20 years are shown in <table-4>. As it shows, Graduates from engineering courses have had better opportunity to get jobs in labor market, compared to their counterparts from other courses of vocational high schools.

<Table 4> Employment rate of graduates from courses in vocational high school

(Unit : %)

	Agricultural & Forest Course		Engineering Course		Commercial Course		Fishery & Marine		Housekeeping & Practical Arts Course		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
1975	41.9	30.3	76.8	59.7	49.4	61.6	71.4	47.5	20.2	19.0	57.5	53.5
1980	38.2	25.1	68.9	84.4	51.0	67.0	64.5	69.7	21.4	24.5	54.8	62.8
1985	51.7	47.7	75.0	89.8	34.1	67.8	68.7	37.3	17.4	28.3	55.4	65.6
1990	89.8	84.8	92.5	93.9	73.2	90.7	79.8	86.4	-	-	81.1	86.7
1995	75.3	69.0	78.7	81.8	68.3	87.2	80.6	89.5	8.3	72.9	71.1	75.4

<source> Ministry of Education(1970-1995).

The <Table 5> shows employment rate of graduates from different courses in vocational high school to the field they have specialized for the last 20 years. As it shows, the rates of graduates from engineering courses have been higher than their counterparts from other courses of vocational high schools.

<Table 5> Employment rate of graduates from vocational high school to specialized field

(Unit : %)

	Agricultural & Forest Course	Engineering Course	Commercial Course	Fishery & Marine Course	Housekeeping & Practical Arts Course	Total
1970	75.0	90.8	86.3	71.7	30.0	86.3
1975	-	-	-	-	-	-
1980	70.2	91.1	80.9	90.8	6.9	83.6
1985	77.9	92.9	84.4	90.6	72.1	86.9
1990	39.2	93.2	86.7	92.1	67.5	85.2
1995	48.3	92.8	83.0	70.2	69.7	83.3

<source> Ministry of Education(1970-1995).

Job Performance

A recent research (Jung, 1996:53) shows indirectly the level of job performance of graduates from technical high schools. The job research asked about 1,300 craftsmen to report their level of job performance in a self-reporting way.

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Treatments For Vocational High School Graduates

Above all, wage differential according to year of schooling has made potential craftsmen avoid TVE and in-service craftsmen leave jobs or move to service jobs. The wage differential by educational attainment, therefore, has been one of main causes of the shortage of craftsmen.

In 1990 the Korean Chamber of Commerce and Industry announced that the average income of craftsmen with four years of experience after graduation exceeded that of entry workers who graduated from four year colleges. This announcement was widely welcomed by the peoples concerned with TVE at the secondary level. It also signaled that experiences and work performance of craftsmen in the field began to be considered more valuable than learning in colleges.

On the other hand, the reform of promotion system based on individuals' vocational abilities and achievements is needed. Both the government and private firms try together to form better social circumstances in which field workers are treated as equally as office workers. Also, social respects will be given to certified craftsmen, so as to encourage young people to participate in vocational and technical education.

REFORM OF TVE

Korean Government's reformative efforts in view of improving the linkage and cooperation between TVE and the world of work are well shown in the Report of Presidential Commission on Education Reform presented to the President on February 9, 1996. Major contents of the report is summed up below (The Presidential Commission on Education Reform, 1996).

The main focus of the reform is aimed at enabling the individual learner to chart his future course based on his or her interests and talents and allowing him or her to select academic courses that reflect his or her unique needs. The reform will:

- Revise the past policy emphasis of vocational education on quantity, and emphasize quality instead of quantity in the management of the programmes

- Develop existing vocational high schools on various ways according to the needs of the local region and situation of the schools to ensure students the opportunity to choose what they wish to study;

- Guarantee each vocational educational organization the right to exercise its autonomy and ingenuity to strengthen its activities.

Strengthening of School-Industry Cooperation

The scope of school-industry cooperation will be extended to provide students of vocational high schools with on-site training. The duration, time and type of training will be managed flexibly. The curriculum will be organized and administered in cooperation with the industries. The regional "Vocational Education and Training Council" will be strengthened with the participation of industries. Business personnel from industry will be encouraged to take part in the School Council.

Quality Teachers In Vocational Education

As a measure to upgrade the quality of education for vocational high schools, personnel from various industries will be invited to conduct practical classes while in-service training for regular teachers will be enforced.

- Diversify ways of fostering and recruiting vocational subject teachers for vocational high schools: Invite experienced personnel from industries to teach practical training at vocational high schools (e.g., introduce a system allowing retired persons with technical expertise to obtain teaching qualifications);

- Utilization of competent industrial personnel as lecturers: High-calibre technicians and business administrators to be utilized as part-time lecturers, circuit lecturers, faculty members or on-site technical training instructors. If necessary, the individual will be appointed as a temporary member of the faculty on a contract basis;

- Dispatch of technical training teachers to companies for on-site experience : Enable the technical training teachers to gain on-site experience and, as a result, develop their professional

competency by sending them to work at industries (e.g., introduce an in-service training term system).

The New University System

The New University System will be introduced to raise the overall educational standard of the adult population engaged on economic activities. This system will enable them to further education without leaving their place of work. The New Universities will be different from the existing vocational education institutions in the following aspects:

- Those eligible for the programme are workers who will become students;
- The work place will become the site of practical training; and
- Multi-media information technology and the distance educational system will be used. Those eligible for establishing and managing the New Universities are junior colleges, polytechnic universities, Korea National Open University, general universities and business organizations (e.g., state and private companies, industrial unions, economic organizations, etc.). The New Universities, which effectively link the industrial site with existing institutions of higher learning through the use of the distance educational system, have two main educational formulae;
- A professor who concurrently works at the industrial firm will be responsible for the practical training at the production site (participation of industries required);
- Classes on both theories of the specialization area and general courses will be conducted through the distance system using advanced communications technology.

Strengthening Links Between Vocational Education and the Certification

The links between vocational education programmes and the qualification obtaining process will be strengthened to expand an adequate on-site education system. In the case of skilled technicians, they will be able to receive their certification without having to take a test if they have successfully completed programmes in a vocational high school and a vocational training centre.

Holders of the national technical certification will be able to receive credits for the courses related to the examinations they took for their qualification when they apply for junior college to study in a related field.

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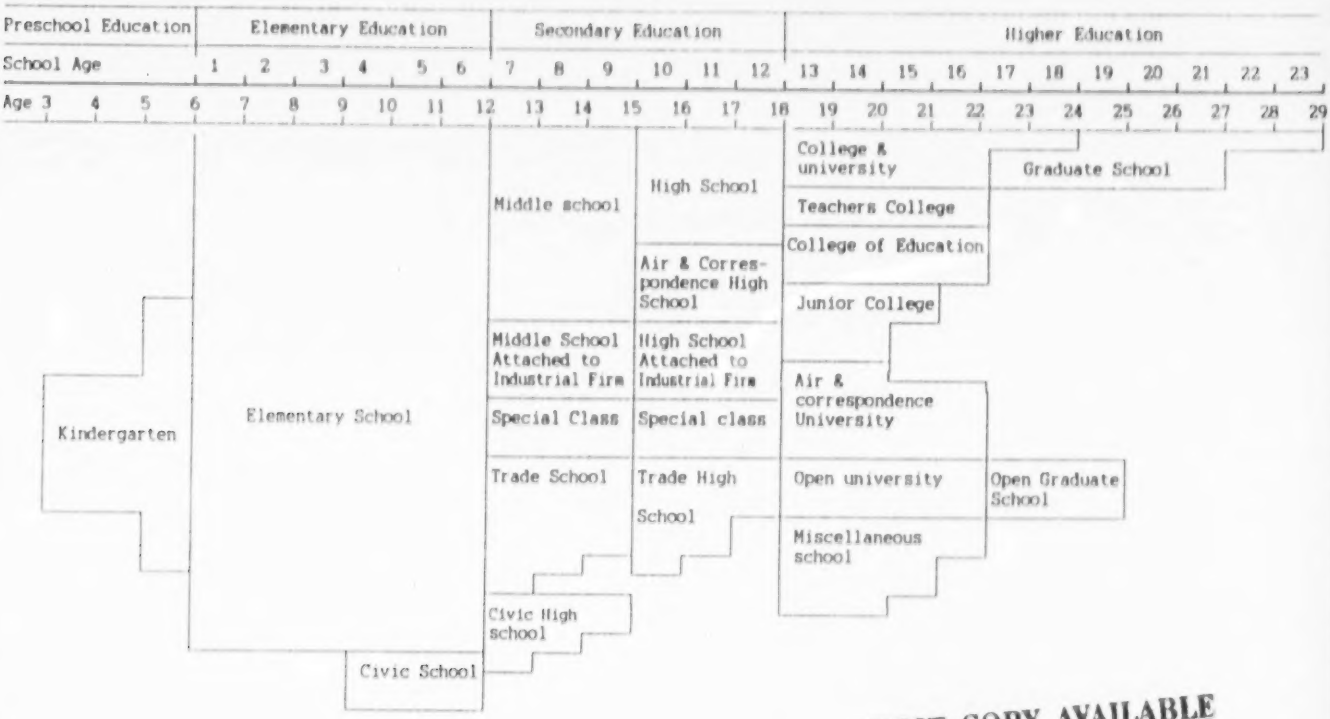
< Appendices>

1. Educational System of Korea


Preschool Education
Elementary Education
Secondary Education
Higher Education
School Age
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Age 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Kindergarten
Elementary School
Civic School
Middle school
High School
Middle School Attached to Industrial Firm
High School Attached to Industrial Firm
Special Class
Special class
Trade School
Trade High School
Civic High school
Air & Correspondence High School
College & university
Graduate School
Teachers College
College of Education
Junior College
Air & correspondence University
Open university
Open Graduate School
Miscellaneous school

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2. General statistics on TVE

<Table-1> Trend in Number of School and Student in General and Vocational High School
(unit: school, person, %)

	General High School			Vocational High School		
	Number of School	Number of Student	Ratio	Number of School	Number of Student	Ratio
1970	408	315,367	53.4	481	275,015	46.6
1975	673	648,149	54.7	479	474,868	42.3
1980	748	932,605	55.0	605	764,187	45.0
1985	967	1,266,840	58.9	635	885,962	41.1
1990	1,096	1,473,155	64.5	587	810,651	35.5
1995	1,068	1,246,427	57.8	762	911,453	42.2

<source> Ministry of Education(1970-1995) 「Statistical Yearbook of Education」.

<Table-2> Trend in Number of Student in Vocational High School
(unit: person, %)

	Agricultural High School	Technical High School	Commercial High School	Fishery & Marine High School	Comprehensive High School	Vocational High School	Total
1980	55,105	220,304	347,645	10,294	150,046	47,861	831,255
	(6.6)	(26.5)	(41.8)	(1.2)	(18.1)	(5.8)	(100.0)
1985	51,842	198,354	380,267	10,030	203,659	41,810	885,962
	(5.9)	(22.4)	(43.0)	(1.1)	(23.0)	(4.7)	(100.0)
1990	40,646	191,980	370,889	9,336	181,094	16,706	810,651
	(5.0)	(23.7)	(45.8)	(1.2)	(22.3)	(2.1)	(100.0)
1995	21,338	273,638	355,504	6,791	188,484	65,698	911,453
	(2.3)	(30.0)	(39.0)	(0.7)	(20.7)	(7.2)	(100.0)

<source> Ministry of Education(1970-1995), 「Statistical Yearbook of Education」.